

APPENDIX 6B

SUPPLEMENTAL TABLES

Table 1. Applicability of Surface Water Samples For Human Health Risk Assessment

Location	Sample Date	Base/Storm	Current Station	Future Station	Current Human Health?	Future Human Health?	Comments/Rationale for Exclusion
SW-MC-05	6/18/1999	Baseflow	HB01	HB01	Y	Y	
SW-MC-05-01	6/18/1999	Baseflow	NA	NA	N	N	
SW-MC-06	6/18/1999	Baseflow	HB01	HB01	Y	Y	Sample collected in 10.8' of water
SW-MC-07	6/18/1999	Baseflow	HB01	HB01	Y	Y	
SW-MC-07-01	6/18/1999	Baseflow	NA	NA	N	N	Sample collected in 9.8' of water
SW-MC-08	6/22/1999	Baseflow	HB03	HB03	Y	Y	
SW-MC-09	6/22/1999	Baseflow	HB03	HB03	Y	Y	
SW-MC-10	6/21/1999	Baseflow	HB03	HB03	Y	Y	
SW-MC-11	6/21/1999	Baseflow	HB03	HB03	Y	Y	
SW-02-TT	7/14/2001	Baseflow	HB01	HB01	Y	Y	
SW-02-TT	8/23/2001	Baseflow	HB01	HB01	Y	Y	
SW-02-TT	9/18/2001	Baseflow	HB01	HB01	Y	Y	
SW-02-TT	10/22/2001	Baseflow	HB01	HB01	Y	Y	
SW-02-TT	11/19/2001	Baseflow	NA	NA	N	N	No exposure during winter months
SW-02-TT	12/17/2001	Baseflow	NA	NA	N	N	No exposure during winter months
SW-02-TT	1/4/2002	Baseflow	NA	NA	N	N	No exposure during winter months
SW-02-TT	2/15/2002	Baseflow	NA	NA	N	N	No exposure during winter months
SW-02-TT	3/12/2002	Baseflow	NA	NA	N	N	No exposure during winter months
SW-02-TT	4/17/2002	Baseflow	NA	NA	N	N	No exposure during winter months
SW-02-TT	5/8/2002	Baseflow	HB01	HB01	Y	Y	
SW-02-TT	6/20/2002	Baseflow	HB01	HB01	Y	Y	
SW-02-TT	7/16/2002	Baseflow	HB01	HB01	Y	Y	
SW-02-TT	8/6/2002	Baseflow	HB01	HB01	Y	Y	
SW-02-TT	9/10/2002	Baseflow	HB01	HB01	Y	Y	
SW-02-TT	10/25/2002	Baseflow	HB01	HB01	Y	Y	
SW-02-TT (and dupl.)	4/26/2002	Storm Event	HB01	HB01	Y	Y	
SW-02-TT	5/15/2002	Storm Event	HB01	HB01	Y	Y	
SW-02-TT	7/25/2002	Storm Event	HB01	HB01	Y	Y	
SW-02-TT	9/25/2002	Storm Event	HB01	HB01	Y	Y	
SW-02-TT	10/18/2002	Storm Event	HB01	HB01	Y	Y	
SW-03-TT	7/14/2001	Baseflow	AR	AR	Y	Y	
SW-03-TT	8/23/2001	Baseflow	AR	AR	Y	Y	
SW-03-TT	9/18/2001	Baseflow	AR	AR	Y	Y	
SW-03-TT	10/22/2001	Baseflow	AR	AR	Y	Y	
SW-03-TT	11/19/2001	Baseflow	NA	NA	N	N	No exposure during winter months
SW-03-TT	12/17/2001	Baseflow	NA	NA	N	N	No exposure during winter months
SW-03-TT	1/4/2002	Baseflow	NA	NA	N	N	No exposure during winter months
SW-03-TT	2/15/2002	Baseflow	NA	NA	N	N	No exposure during winter months
SW-03-TT	3/12/2002	Baseflow	NA	NA	N	N	No exposure during winter months
SW-03-TT	4/17/2002	Baseflow	NA	NA	N	N	No exposure during winter months
SW-03-TT	5/8/2002	Baseflow	AR	AR	Y	Y	
SW-03-TT	6/20/2002	Baseflow	AR	AR	Y	Y	
SW-03-TT	7/16/2002	Baseflow	AR	AR	Y	Y	
SW-03-TT	8/6/2002	Baseflow	AR	AR	Y	Y	
SW-03-TT	9/10/2002	Baseflow	AR	AR	Y	Y	
SW-03-TT	10/25/2002	Baseflow	AR	AR	Y	Y	
SW-03-TT	4/26/2002	Storm Event	AR	AR	Y	Y	
SW-03-TT	5/15/2002	Storm Event	AR	AR	Y	Y	
SW-03-TT (and dupl.)	7/25/2002	Storm Event	AR	AR	Y	Y	
SW-03-TT	8/31/2002	Storm Event	AR	AR	Y	Y	
SW-03-TT (and dupl.)	9/25/2002	Storm Event	AR	AR	Y	Y	
SW-03-TT (and dupl.)	10/18/2002	Storm Event	AR	AR	Y	Y	
SW-04-TT	7/14/2001	Baseflow	HB03	HB03	Y	Y	
SW-04-TT	8/23/2001	Baseflow	HB03	HB03	Y	Y	
SW-04-TT	9/18/2001	Baseflow	HB03	HB03	Y	Y	
SW-04-TT	10/22/2001	Baseflow	HB03	HB03	Y	Y	
SW-04-TT	11/19/2001	Baseflow	NA	NA	N	N	No exposure during winter months
SW-04-TT	12/17/2001	Baseflow	NA	NA	N	N	No exposure during winter months
SW-04-TT	1/4/2002	Baseflow	NA	NA	N	N	No exposure during winter months
SW-04-TT	2/15/2002	Baseflow	NA	NA	N	N	No exposure during winter months
SW-04-TT	3/12/2002	Baseflow	NA	NA	N	N	No exposure during winter months
SW-04-TT	4/17/2002	Baseflow	NA	NA	N	N	No exposure during winter months
SW-04-TT	5/8/2002	Baseflow	HB03	HB03	Y	Y	
SW-04-TT	6/20/2002	Baseflow	HB03	HB03	Y	Y	
SW-04-TT	7/16/2002	Baseflow	HB03	HB03	Y	Y	
SW-04-TT	8/6/2002	Baseflow	HB03	HB03	Y	Y	
SW-04-TT	9/10/2002	Baseflow	HB03	HB03	Y	Y	
SW-04-TT	10/25/2002	Baseflow	HB03	HB03	Y	Y	
SW-04-TT	4/26/2002	Storm Event	HB03	HB03	Y	Y	
SW-04-TT	5/16/2002	Storm Event	HB03	HB03	Y	Y	
SW-04-TT	7/25/2002	Storm Event	HB03	HB03	Y	Y	
SW-04-TT	8/31/2002	Storm Event	HB03	HB03	Y	Y	
SW-04-TT	9/25/2002	Storm Event	HB03	HB03	Y	Y	
SW-04-TT	10/18/2002	Storm Event	HB03	HB03	Y	Y	
SW-04-IP	08/29/2000	Baseflow	HB01	HB01	Y	Y	
SW-04-IP	10/04/2000	Baseflow	HB01	HB01	Y	Y	

Table 1. Applicability of Surface Water Samples For Human Health Risk Assessment

Location	Sample Date	Base/Storm	Current Station	Future Station	Current Human Health?	Future Human Health?	Comments/Rationale for Exclusion
SW-04-IP	04/04/2001	Baseflow	NA	NA	N	N	No exposure during winter months
SW-04-IP	09/15/2000	Storm Event	HB01	HB01	Y	Y	
SW-04-IP	10/05/2000	Storm Event	HB01	HB01	Y	Y	
SW-04-IP	10/18/2000	Storm Event	HB01	HB01	Y	Y	
SW-04-IP	03/30/2001	Storm Event	HB01	HB01	Y	Y	
SW-04-IP	05/22/2001	Storm Event	HB01	HB01	Y	Y	
SW-09-IP	08/29/2000	Baseflow	HB03	HB03	Y	Y	
SW-09-IP	10/04/2000	Baseflow	HB03	HB03	Y	Y	
SW-09-IP	04/04/2001	Baseflow	NA	NA	N	N	No exposure during winter months
SW-09-IP	12/17/2000	Post Turnover	NA	NA	N	N	No exposure during winter months
SW-09-IP	09/02/2000	Storm Event	HB03	HB03	Y	Y	
SW-09-IP	09/15/2000	Storm Event	HB03	HB03	Y	Y	
SW-09-IP	10/05/2000	Storm Event	HB03	HB03	Y	Y	
SW-09-IP	10/18/2000	Storm Event	HB03	HB03	Y	Y	
SW-09-IP	03/21/2001	Storm Event	HB03	HB03	Y	Y	
SW-09-IP	03/30/2001	Storm Event	HB03	HB03	Y	Y	
SW-09-IP	05/22/2001	Storm Event	HB03	HB03	Y	Y	

Reference Samples

SW-23-01	8/30/1995		23	23	Y	Y	Riv/Strm
SW-24-01	8/30/1995		24	24	Y	Y	Wetland
SW-25-01 (and dupl.)	9/11/1995		25	25	Y	Y	Pond/Lake
SW-26-01	9/11/1995		26	26	Y	Y	Pond/Lake
SW-27-01	9/12/1995		27	27	Y	Y	Riv/Strm
SW-MC-01	6/21/1999		01-IP	01-IP	Y	Y	Riv/Strm
SW-MC-02 (and dupl.)	6/21/1999		02-IP	02-IP	Y	Y	Pond/Lake
SW-MC-03	6/18/1999		03-IP	03-IP	Y	Y	Pond/Lake
SW-MC-03-01	6/18/1999		03-IP	03-IP	Y	Y	Pond/Lake
SW-MC-04	6/17/1999		04-IP	04-IP	Y	Y	Riv/Strm
SW-MC-12	6/17/1999		12-IP	12-IP	Y	Y	Riv/Strm

Table 2. Applicability of Sediment Samples For Human Health Risk Assessment

Location	Standing Water Depth (ft)	Current Station	Future Station	Current Human Health?	Future Human Health?	Comments/Rationale for Exclusion
AR01	0-0.5	AR	AR	Y	Y	
AR02	0-0.5	AR	AR	Y	Y	
AR03	0-0.5	AR	AR	Y	Y	
AR04	0-0.5	AR	AR	Y	Y	
AR05	0-0.5	AR	AR	Y	Y	
AR06 (and dupl.)	0-0.5	AR	AR	Y	Y	
AR sediment samples to be combined with surface water from Station AR (see Appendix 6B Table 1)						
BE01	0-0.33	BE-1	BE-1	Y	Y	
BE02	0-0.25	BE-1	BE-1	Y	Y	
BE03	3.5	NA	NA	N	N	Sample collected below more than 2' of surface water
BE04	0-0.5	NA	BE-1	N	Y	Not currently accessible due to remote location
BE05	0-0.5	NA	BE-1	N	Y	Not currently accessible due to remote location
BE06	0-0.5	NA	BE-1	N	Y	Not currently accessible due to remote location
No surface water samples are appropriate for combination						
BE08	0-0.5	NA	BE-2	N	Y	Not currently accessible due to remote location
BE09	0-0.5	NA	BE-2	N	Y	Not currently accessible due to remote location
BE10	0-0.5	NA	BE-2	N	Y	Not currently accessible due to remote location
BE11	0-0.5	NA	BE-2	N	Y	Not currently accessible due to remote location
BE-2 sediment samples to be combined with surface water from Station HB01 (see Appendix 6B Table 1)						
HB01-01	0.3	HB01/A6	HB01/A6	Y	Y	
HB01-02	0.1	HB01/A6	HB01/A6	Y	Y	
HB01-03	0.9	HB01/A6	HB01/A6	Y	Y	
HB01-04	0.5	HB01/A6	HB01/A6	Y	Y	
HB01-05	~0.5 - 1 ft	HB01/A6	HB01/A6	Y	Y	
HB01-06 (and dupl.)	0.5	HB01/A6	HB01/A6	Y	Y	
HB01-07	0.8	HB01/A6	HB01/A6	Y	Y	
HB01-08	0.8	HB01/A6	HB01/A6	Y	Y	
HB01-09	0.4	HB01/A6	HB01/A6	Y	Y	
HB01-10	0.6	HB01/A6	HB01/A6	Y	Y	
SD-MC-06	1.0	HB01/A6	HB01/A6	Y	Y	
HB01/A6 sediment samples to be combined with surface water from Station HB01 (see Appendix 6B Table 1)						
HB02-01	0.8 -1.0	NA	NA	N	N	>20' from shore and within dense phragmites
HB02-02	0.8	NA	NA	N	N	>20' from shore and within dense phragmites
HB02-03	0.5	NA	NA	N	N	>20' from shore and within dense phragmites
HB02-04 (and dupl.)	0.4	NA	HB02/HB04	N	Y	Not currently accessible due to remote location
HB02-05	0.6 - 1.0	NA	HB02/HB04	N	Y	Not currently accessible due to remote location
HB02-06	0.6-0.8	NA	HB02/HB04	N	Y	Not currently accessible due to remote location
HB02-07	0.3-0.5	NA	HB02/HB04	N	Y	Not currently accessible due to remote location
HB02-08	0.3-0.6	NA	NA	N	N	>20' from shore and within dense phragmites
HB02-09	0.1	NA	NA	N	N	>20' from shore and within dense phragmites
HB02-10	0.5	NA	NA	N	N	>20' from shore and within dense phragmites
HB02-11	0.0	NA	HB02/HB04	N	Y	Not currently accessible due to remote location
HB02-12	0.0	NA	HB02/HB04	N	Y	Not currently accessible due to remote location
HB02-13	0.0	NA	HB02/HB04	N	Y	Not currently accessible due to remote location
HB02-14	0.0	NA	HB02/HB04	N	Y	Not currently accessible due to remote location
HB02-15	0.0	NA	HB02/HB04	N	Y	Not currently accessible due to remote location
HB02-16	0.0	NA	HB02/HB04	N	Y	Not currently accessible due to remote location
HB02-17	0.0	NA	HB02/HB04	N	Y	Not currently accessible due to remote location
HB02/HB04 sediment samples to be combined with surface water from Station HB03 (see Appendix 6B Table 1)						
HB03-01	0.4	NA	NA	N	N	>20' from shore and within dense phragmites
HB03-02	0.2	NA	NA	N	N	>20' from shore and within dense phragmites
HB03-03	0.3	NA	NA	N	N	>20' from shore and within dense phragmites
HB03-04	0.5	HB03	HB03	Y	Y	
HB03-05 (and dupl.)	0.3	NA	NA	N	N	>20' from shore and within dense phragmites
HB03-06	0.4	NA	NA	N	N	>20' from shore and within dense phragmites
HB03-07	0.2	NA	NA	N	N	>20' from shore and within dense phragmites
HB03-08	0.6	NA	NA	N	N	>20' from shore and within dense phragmites
HB03-09	0.4	HB03	HB03	Y	Y	
HB03-10	0.5	HB03	HB03	Y	Y	
HB03-11 (and dupl.)	0.0	HB03	HB03	Y	Y	
HB03-12	0.0	HB03	HB03	Y	Y	
HB03-13	0.0	HB03	HB03	Y	Y	
HB03-14	0.0	HB03	HB03	Y	Y	
HB03-15	0.0	HB03	HB03	Y	Y	
HB03-16	0.0	HB03	HB03	Y	Y	
HB03-17	0.0	HB03	HB03	Y	Y	
HB03 sediment samples to be combined with surface water from Station HB03 (see Appendix 6B Table 1)						
SC0101	NA	NA	SC01	N	Y	Future dredging scenario
SC0112	NA	NA	SC01	N	Y	Future dredging scenario
SC0123	NA	NA	SC01	N	Y	Future dredging scenario
SC0134	NA	NA	SC01	N	Y	Future dredging scenario
SC0201	NA	NA	SC02	N	Y	Future dredging scenario
SC0212	NA	NA	SC02	N	Y	Future dredging scenario
SC0223	NA	NA	SC02	N	Y	Future dredging scenario
SC0234	NA	NA	SC02	N	Y	Future dredging scenario

Table 2. Applicability of Sediment Samples For Human Health Risk Assessment

Location	Standing Water Depth (ft)	Current Station	Future Station	Current Human Health?	Future Human Health?	Comments/Rationale for Exclusion
SC0301	NA	NA	SC03	N	Y	Future dredging scenario
SC0312	NA	NA	SC03	N	Y	Future dredging scenario
SC0323	NA	NA	SC03	N	Y	Future dredging scenario
SC0334	NA	NA	SC03	N	Y	Future dredging scenario
SC0401 (and dupl.)	NA	NA	SC04	N	Y	Future dredging scenario
SC0412	NA	NA	SC04	N	Y	Future dredging scenario
SC0423	NA	NA	SC04	N	Y	Future dredging scenario
SC0434	NA	NA	SC04	N	Y	Future dredging scenario
SD-MC-05 (and dupl.)	12.8	NA	NA	N	N	Sample collected below more than 2' of surface water
SD-MC-07	11.8	NA	NA	N	N	Sample collected below more than 2' of surface water
SD-MC-08	0.5	NA	NA	N	N	>20' from shore and within dense phragmites
SD-MC-09	1.0	NA	NA	N	N	>20' from shore and within dense phragmites
SD-MC-10	0.5	NA	NA	N	N	>20' from shore and within dense phragmites
SD-MC-11	3.5	NA	NA	N	N	Sample collected below more than 2' of surface water
SD-MC-13	1.4	NA	NA	N	N	Not currently accessible due to remote location; land use unlikely to change in the future

Reference Samples

SD-HB-00-TR	0.8	HB	HB	Y	Y	Wetland
SD-23-01-FW	NA	23	23	Y	Y	Riv/Strm
SD-23-02-FW	1.5	23	23	Y	Y	Riv/Strm
SD-23-03-FW	1.0	23	23	Y	Y	Riv/Strm
SD-24-01-FW	0.7	24	24	Y	Y	Wetland
SD-24-02-FW	1.0	24	24	Y	Y	Wetland
SD-24-03-FW	NA	24	24	Y	Y	Wetland
SD-24-03-ME	1.0	24	24	Y	Y	Wetland
SD-25-01-FW	3.5	25	25	N	N	Sample collected below more than 2' of surface water
SD-25-02-FW	4.0	25	25	N	N	Sample collected below more than 2' of surface water
SD-25-02-ME	NA	25	25	N	N	Sample collected below more than 2' of surface water
SD-25-03-FW	3.0	25	25	N	N	Sample collected below more than 2' of surface water
SD-26-01-FW	3.0	26	26	N	N	Sample collected below more than 2' of surface water
SD-26-02-FW (and dupl.)	2.5	26	26	N	N	Sample collected below more than 2' of surface water
SD-26-03-FW	2.5	26	26	N	N	Sample collected below more than 2' of surface water
SD-27-01-FW	2.5	27	27	N	N	Sample collected below more than 2' of surface water
SD-27-02-FW	1.5	27	27	Y	Y	Riv/Strm
SD-27-03-FW	1.5	27	27	Y	Y	Riv/Strm
SD-MC-01	0.25	01-IP	01-IP	Y	Y	Riv/Strm
SD-MC-01-TR	0.25	01-IP	01-IP	Y	Y	Riv/Strm
SD-MC-02	1.5	02-IP	02-IP	Y	Y	Pond/Lake
SD-MC-03	9.2	03-IP	03-IP	N	N	Sample collected below more than 2' of surface water
SD-MC-03-TR	13	03-IP	03-IP	N	N	Sample collected below more than 2' of surface water
SD-MC-04	1.3	04-IP	04-IP	Y	Y	Riv/Strm
SD-MC-04-TR	0.4	04-IP	04-IP	Y	Y	Riv/Strm
SD-MC-12	1.3	12-IP	12-IP	Y	Y	Riv/Strm
SD-SA-01-TR	0.7	SA	SA	Y	Y	Wetland

Table 3. Applicability of Soil Samples For Human Health Risk Assessment

Location	Current Station	Future Station	Current Human Health?	Future Human Health?	Comments/Rationale for Exclusion
A601 (0-1)	HB01/A6	HB01/A6	Y	Y	
A601 (1-2)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A601 (2-3)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A602 (0-1)	HB01/A6	HB01/A6	Y	Y	
A602 (1-2)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A602 (2-3)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A603 (0-1)	HB01/A6	HB01/A6	Y	Y	
A603 (1-2)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A603 (2-3)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A604 (1-2)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A604 (0-1)	HB01/A6	HB01/A6	Y	Y	
A604 (2-3)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A605 (0-1)	HB01/A6	HB01/A6	Y	Y	
A605 (1-2)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A605 (2-3)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A606 (0-1)	HB01/A6	HB01/A6	Y	Y	
A606 (1-2)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A606 (2-3)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A607 (2-3)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A607 (0-1)	HB01/A6	HB01/A6	Y	Y	
A607 (1-2)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A608 (0-1)	HB01/A6	HB01/A6	Y	Y	
A608 (1-2)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A608 (2-3)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A609 (0-1)	HB01/A6	HB01/A6	Y	Y	
A609 (1-2)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A610 (0-1)	HB01/A6	HB01/A6	Y	Y	
A610 (1-2)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A610 (2-3)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A611 (1-2)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A611 (0-1)	HB01/A6	HB01/A6	Y	Y	
A611 (2-2.5)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A612 (0-1)	HB01/A6	HB01/A6	Y	Y	
A612 (1-2)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A613 (0-1)	HB01/A6	HB01/A6	Y	Y	
A613 (1-2)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
A613 (2-3)	NA	HB01/A6	N	Y	Not currently accessible due to depth; may become accessible in the future
HB04-01 (0-0.5)	HB04	HB02/HB04	Y	Y	
HB04-02 (0-0.5)	HB04	HB02/HB04	Y	Y	
HB04-03 (0-0.5)	HB04	HB02/HB04	Y	Y	
HB04-04 (0-0.5)	HB04	HB02/HB04	Y	Y	
HB04-05 (0-0.5)	HB04	HB02/HB04	Y	Y	
HB04-06 (0-0.5)	HB04	HB02/HB04	Y	Y	
HB04-07 (0-0.5)	HB04	HB02/HB04	Y	Y	
HB04-08 (0-0.5)	HB04	HB02/HB04	Y	Y	
HB04-09 (0-0.5)	HB04	HB02/HB04	Y	Y	
HB04-10 (0-0.5)	HB04	HB02/HB04	Y	Y	
SO-01 (10-10)	NA	SO	N	Y	Not currently accessible due to depth; may become accessible in the future
SO-01 (0-1)	SO	SO	Y	Y	
SO-02 (4-4)	NA	SO	N	Y	Not currently accessible due to depth; may become accessible in the future
SO-02 (0-1)	SO	SO	Y	Y	
SO-03 (8-8)	NA	SO	N	Y	Not currently accessible due to depth; may become accessible in the future
SO-03 (0-1)	SO	SO	Y	Y	
SO-04 (0-1)	SO	SO	Y	Y	
SO-05 (8-8)	NA	SO	N	Y	Not currently accessible due to depth; may become accessible in the future
SO-05 (0-1)	SO	SO	Y	Y	
SO-06 (12-12)	NA	SO	N	Y	Not currently accessible due to depth; may become accessible in the future
SO-06 (0-1)	SO	SO	Y	Y	
SO-07 (0-1)	SO	SO	Y ¹	Y	
SO-08 (8-8)	NA	SO	N	Y	Not currently accessible due to depth; may become accessible in the future
SO-08 (0-1)	SO	SO	Y	Y	
SO-09 (4-4)	NA	SO	N	Y	Not currently accessible due to depth; may become accessible in the future
SO-09 (0-1)	SO	SO	Y ¹	Y	
SO-10 (8-8)	NA	SO	N	Y	Not currently accessible due to depth; may become accessible in the future
SO-10 (0-1)	SO	SO	Y ¹	Y	
SO-11 (12-12)	NA	SO	N	Y	Not currently accessible due to depth; may become accessible in the future
SO-11 (0-1)	SO	SO	Y ¹	Y	
SO-12 (0-1)	SO	SO	Y ¹	Y	
SO-13 (8-8)	NA	SO	N	Y	Not currently accessible due to depth; may become accessible in the future
SO-13 (0-1)	SO	SO	Y	Y	
SO-14 (8-8)	NA	SO	N	Y	Not currently accessible due to depth; may become accessible in the future
SO-14 (0-1)	SO	SO	Y	Y	
SO-15 (0-1)	SO	SO	Y	Y	
SO-16 (10-10)	NA	SO	N	Y	Not currently accessible due to depth; may become accessible in the future
SO-16 (0-1)	SO	SO	Y	Y	

Table 3. Applicability of Soil Samples For Human Health Risk Assessment

Location	Current Station	Future Station	Current Human Health?	Future Human Health?	Comments/Rationale for Exclusion
SO-17 (24-24)	NA	NA	N	N	Too deep for human contact currently or in the future
SO-17 (0-1)	SO	SO	Y	Y	
SO-18 (0-1)	SO	SO	Y	Y	
SO-19 (12-12)	NA	SO	N	Y	Not currently accessible due to depth; may become accessible in the future
SO-19 (0-1)	SO	SO	Y	Y	
SO-20 (8-8)	NA	SO	N	Y	Not currently accessible due to depth; may become accessible in the future
SO-20 (0-1)	SO	SO	Y	Y	

Notes

1. Sample applicable to current day care child exposures.

Table 4. Applicability of Fish Tissue Samples For Human Health Risk Assessment

Sample ID	Location	Sample Date	Species	Tissue Type	Current/Future Human Health?
FI-MC-HBHA3-BB1-F	HBHA3	6/14/1999	Brown Bullhead	Fillet	Y
FI-MC-HBHA3-BB2-F	HBHA3	6/14/1999	Brown Bullhead	Fillet	Y
FI-MC-HBHA3-LMB1-F	HBHA3	6/14/1999	Largemouth Bass	Fillet	Y
FI-MC-HBHA3-LMB2-F	HBHA3	6/14/1999	Largemouth Bass	Fillet	Y
FI-MC-HBHA3-LMB3-F	HBHA3	6/14/1999	Largemouth Bass	Fillet	Y
FI-MC-HBHA3-WS10-F	HBHA3	6/14/1999	White Sucker	Fillet	Y
FI-MC-HBHA3-WS1-F	HBHA3	6/14/1999	White Sucker	Fillet	Y
FI-MC-HBHA3-WS2-F	HBHA3	6/14/1999	White Sucker	Fillet	Y
FI-MC-HBHA3-WS5-F	HBHA3	6/14/1999	White Sucker	Fillet	Y
FI-MC-HBHA3-WS9-F	HBHA3	6/14/1999	White Sucker	Fillet	Y
FI-MC-HBHAP-BB1-F	HBHAP	6/15/1999	Brown Bullhead	Fillet	Y
FI-MC-HBHAP-BB2-F	HBHAP	6/15/1999	Brown Bullhead	Fillet	Y
FI-MC-HBHAP-BB3-F	HBHAP	6/17/1999	Brown Bullhead	Fillet	Y
FI-MC-HBHAP-LMB1-F	HBHAP	6/14/1999	Largemouth Bass	Fillet	Y
FI-MC-HBHAP-LMB2-F	HBHAP	6/14/1999	Largemouth Bass	Fillet	Y
FI-MC-HBHAP-LMB3-F	HBHAP	6/14/1999	Largemouth Bass	Fillet	Y
FI-MC-HBHAP-LMB4-F	HBHAP	6/14/1999	Largemouth Bass	Fillet	Y
FI-MC-HBHAP-LMB5-F	HBHAP	6/14/1999	Largemouth Bass	Fillet	Y
FI-MC-HBHAP-LMB6-F	HBHAP	6/14/1999	Largemouth Bass	Fillet	Y
FI-MC-HBHAP-LMB7-F	HBHAP	6/15/1999	Largemouth Bass	Fillet	Y
FI-MC-HBHAP-LMB8-F	HBHAP	6/15/1999	Largemouth Bass	Fillet	Y
FI-MC-HBHAP-LMB9-F	HBHAP	6/15/1999	Largemouth Bass	Fillet	Y
FI-MC-HBHAP-WS1-F	HBHAP	6/14/1999	White Sucker	Fillet	Y
FI-MC-HBHAP-WS4-F	HBHAP	6/14/1999	White Sucker	Fillet	Y
FI-MC-HBHAP-WS5-F	HBHAP	6/14/1999	White Sucker	Fillet	Y
FI-MC-HBHAP-WS6-F	HBHAP	6/14/1999	White Sucker	Fillet	Y
FI-MC-HBHAP-WS7-F	HBHAP	6/14/1999	White Sucker	Fillet	Y
FI-MC-HBHAP-WS8-F	HBHAP	6/14/1999	White Sucker	Fillet	Y

Reference Samples

LF-LB-01-F	Wright's Pond	8/3/1995	Largemouth Bass	Fillet	Y
LF-LB-02-F	Wright's Pond	8/3/1995	Largemouth Bass	Fillet	Y
LF-LB-03-F	Wright's Pond	8/3/1995	Largemouth Bass	Fillet	Y
LF-LB-04-F	Wright's Pond	8/3/1995	Largemouth Bass	Fillet	Y
LF-LB-05-F	Wright's Pond	8/3/1995	Largemouth Bass	Fillet	Y
LF-LB-06-F	Wright's Pond	8/3/1995	Largemouth Bass	Fillet	Y
LF-LB-07-F	Wright's Pond	8/3/1995	Largemouth Bass	Fillet	Y
LF-LB-08-F	Wright's Pond	8/3/1995	Largemouth Bass	Fillet	Y
LF-LB-09-F	Wright's Pond	8/3/1995	Largemouth Bass	Fillet	Y
LF-LB-10-F	Wright's Pond	8/3/1995	Largemouth Bass	Fillet	Y
LF-LB-14-F	Wright's Pond	8/3/1995	Brown Bullhead	Fillet	Y
LF-LB-15-F	Wright's Pond	8/3/1995	Brown Bullhead	Fillet	Y
LF-LB-16-F	Wright's Pond	8/3/1995	Brown Bullhead	Fillet	Y
FI-MC-PP-BB1-F	PP	6/16/1999	Brown Bullhead	Fillet	Y
FI-MC-PP-LMB15-F	PP	6/16/1999	Largemouth Bass	Fillet	Y
FI-MC-PP-LMB17-F	PP	6/16/1999	Largemouth Bass	Fillet	Y
FI-MC-PP-LMB2-F	PP	6/16/1999	Largemouth Bass	Fillet	Y
FI-MC-PP-LMB5-F	PP	6/16/1999	Largemouth Bass	Fillet	Y
FI-MC-PP-LMB6-F	PP	6/16/1999	Largemouth Bass	Fillet	Y
FI-MC-PP-WS11-F	PP	6/16/1999	White Sucker	Fillet	Y
FI-MC-PP-WS13-F	PP	6/16/1999	White Sucker	Fillet	Y
FI-MC-PP-WS1-F	PP	6/16/1999	White Sucker	Fillet	Y
FI-MC-PP-WS3-F	PP	6/16/1999	White Sucker	Fillet	Y
FI-MC-PP-WS8-F	PP	6/16/1999	White Sucker	Fillet	Y
FI-MC-SP-LMB12-F	SP	6/15/1999	Largemouth Bass	Fillet	Y
FI-MC-SP-LMB2-F	SP	6/15/1999	Largemouth Bass	Fillet	Y
FI-MC-SP-LMB4-F	SP	6/15/1999	Largemouth Bass	Fillet	Y
FI-MC-SP-LMB5-F	SP	6/15/1999	Largemouth Bass	Fillet	Y
FI-MC-SP-LMB9-F	SP	6/15/1999	Largemouth Bass	Fillet	Y

Table 5. Applicability of Groundwater Samples For Human Health Risk Assessment

Sample ID	Location	Approximate Screen Depth ¹	Data Grouping	Shallow Groundwater for Future Human Health?	Combined Groundwater for Future Human Health?
IPGW-AC01-0019-013102	AC01	11' - 21'	Study Area	Y	Y
IPGW-AC01-0037-012802	AC01	37'	Study Area	N	Y
IPGW-AC02-0015-041102	AC02	6' - 16'	Study Area	Y	Y
IPGW-AC02-0020-041102	AC02	20'	Study Area	N	Y
IPGW-AC02-0037-041102	AC02	37'?	Study Area	N	Y
IPGW-AC03-0015-041102*	AC03	6' - 16'	Study Area	Y	Y
IPGW-AC03-0033-041002	AC03	33'	Study Area	N	Y
IPGW-AC03-0044-041002	AC03	44'	Study Area	N	Y
IPGW-AC04-0012-041002	AC04	6' - 13'	Study Area	Y	Y
IPGW-AC04-0028-040902	AC04	28'	Study Area	N	Y
IPGW-AC04-0047-040902	AC04	47'	Study Area	N	Y
IPGW-AC05-0015-041002*	AC05	6' - 16'	Study Area	Y	Y
IPGW-AC05-0029-040802	AC05	29'	Study Area	N	Y
IPGW-AC06-0016-013102	AC06	7' - 17'	Study Area	Y	Y
IPGW-AC06-0019-012802	AC06	19'	Study Area	N	Y
IPGW-AC06-0029-012802	AC06	29'	Study Area	N	Y
IPGW-AE01-0011-021202*	AE01	2' - 12'	Study Area	Y	Y
IPGW-AE01-0036-021302*	AE01	27' - 37'	Study Area	N	Y
IPGW-AE01-0045-021102	AE01	45'	Study Area	N	Y
IPGW-AE01-0067-021202	AE01	67'	Study Area	N	Y
IPGW-AE02-0012-021402*	AE02	3' - 13'	Study Area	Y	Y
IPGW-AE02-0046-021302	AE02	46'	Study Area	N	Y
IPGW-AE02-0072-021402	AE02	72'	Study Area	N	Y
IPGW-AE03-0010-020502*	AE03	3' - 12.5'	Study Area	Y	Y
IPGW-AE03-0050-020402	AE03	50'	Study Area	N	Y
IPGW-AE03-0078-020402	AE03	78'	Study Area	N	Y
IPGW-AE04-0013-020502	AE04	5' - 15'	Study Area	Y	Y
IPGW-AE04-0061-020402	AE04	61'	Study Area	N	Y
IPGW-AE04-0088-020502	AE04	88'	Study Area	N	Y
IPGW-AE05-0012-021502*	AE05	3' - 12.5'	Study Area	Y	Y
IPGW-AE05-0028-021902	AE05	28'	Study Area	N	Y
IPGW-AE05-0061-021902	AE05	61'	Study Area	N	Y
IPGW-AE06-0010-020602	AE06	3' - 12.5'	Study Area	Y	Y
IPGW-AE06-0023-020702	AE06	23'	Study Area	N	Y
IPGW-AE06-0043-020602	AE06	43'	Study Area	N	Y
IPGW-AE07-0013-022102*	AE07	5' - 15'	Study Area	Y	Y
IPGW-AE07-0028-022002	AE07	28'	Study Area	N	Y
IPGW-AF01-0025-021102	AF01	16' - 26'	Study Area	Y	Y
IPGW-AF01-0074-011702	AF01	74'	Study Area	N	Y
IPGW-AF01-0115-040802	AF01	115'	Study Area	N	Y
IPGW-AF02-0014-032702*	AF02	5' - 15'	Study Area	Y	Y
IPGW-AF02-0032-032702	AF02	32'	Study Area	N	Y
IPGW-AF02-0075-032602	AF02	75'	Study Area	N	Y
IPGW-AF03-0018-022202	AF03	10' - 19.5'	Study Area	Y	Y
IPGW-AF03-0037-022502	AF03	37'	Study Area	N	Y
IPGW-AF03-0049-022202	AF03	49'	Study Area	N	Y
IPGW-AF03-0061-022502*	AF03	61'	Study Area	N	Y
IPGW-AG01-0012-012202	AG01	7' - 17'	Study Area	Y	Y
IPGW-AG01-0055-012102	AG01	55'	Study Area	N	Y
IPGW-AG01-0071-013102	AG01	71'	Study Area	N	Y
IPGW-AG02-0013-022102	AG02	5' - 14.5'	Study Area	Y	Y
IPGW-AG02-0039-022102	AG02	39'	Study Area	N	Y
IPGW-AG02-0078-022102	AG02	78'	Study Area	N	Y
IPGW-AG03-0015-013002*	AG03	7' - 16.5'	Study Area	Y	Y
IPGW-AG03-0053-012902	AG03	53'?	Study Area	N	Y
IPGW-AG03-0079-020802*	AG03	79'?	Study Area	N	Y
IPGW-AP01-0013-012402	AP01	8.5' - 18.5'	Study Area	Y	Y
IPGW-AP01-0019-012302	AP01	19'?	Study Area	N	Y
IPGW-AP02-0013-012502*	AP02	10' - 14.5'	Study Area	Y	Y
IPGW-AP02-0018-012502	AP02	18'?	Study Area	N	Y
IPGW-AP02-0028-012402	AP02	28'?	Study Area	N	Y
IPGW-AP03-0015-012902*	AP03	6' - 16'	Study Area	Y	Y
IPGW-AP03-0021-012502	AP03	21'	Study Area	N	Y
B1-01-GW-01	B1-01	gw_depth = 01	Study Area	Y	Y
B1-01-GW-02	B1-01	gw_depth = 02	Study Area	N	Y
B1-01-GW-03NS	B1-01	gw_depth = 03	Study Area	N	Y
B1-02-GW-03NS	B1-02	gw_depth = 03	Study Area	N	Y
B1-04-GW-01NS-032901	B1-04	gw_depth = 01	Study Area	Y	Y
B1-04-GW-01NS-041601	B1-04	gw_depth = 01	Study Area	Y	Y
B1-04-GW-01NS-041701	B1-04	gw_depth = 01	Study Area	Y	Y
B1-04-GW-01NS-041801	B1-04	gw_depth = 01	Study Area	Y	Y
CB1-04-GW-01NS-073001	B1-04	gw_depth = 01	Study Area	Y	Y
CB1-04-GW-01NS-073101	B1-04	gw_depth = 01	Study Area	N ³	N ³
CB1-04-GW-01NS-080101	B1-04	gw_depth = 01	Study Area	N ³	N ³
CB1-04-GW-01NS-080301	B1-04	gw_depth = 01	Study Area	N ³	N ³

Table 5. Applicability of Groundwater Samples For Human Health Risk Assessment

Sample ID	Location	Approximate Screen Depth ¹	Data Grouping	Shallow Groundwater for Future Human Health?	Combined Groundwater for Future Human Health?
CB1-04-GW-01NS-081501	B1-04	gw_depth = 01	Study Area	N ³	N ³
CB1-04-GW-01NS-110701	B1-04	gw_depth = 01	Study Area	N ³	N ³
B1-04-GW-02NS	B1-04	gw_depth = 02	Study Area	N	Y
B1-04-GW-03NS	B1-04	gw_depth = 03	Study Area	N	Y
B1-05-GW-01	B1-05	gw_depth = 01	Study Area	Y	Y
B1-05-GW-02	B1-05	gw_depth = 02	Study Area	N	Y
B1-05-GW-03	B1-05	gw_depth = 03	Study Area	N	Y
B2-01-GW-01	B2-01	gw_depth = 01	Study Area	Y	Y
B2-02-GW-01NS	B2-02	gw_depth = 01	Study Area	N ³	N ³
B2-02-GW-02NS	B2-02	gw_depth = 02	Study Area	N	Y
B2-02-GW-03	B2-02	gw_depth = 03	Study Area	N	Y
B2-03-GW-01	B2-03	gw_depth = 01	Study Area	Y	Y
B2-03-GW-02	B2-03	gw_depth = 02	Study Area	N	Y
B2-03-GW-03NS	B2-03	gw_depth = 03	Study Area	N	Y
B2-04-GW-01	B2-04	gw_depth = 01	Study Area	Y	Y
B2-04-GW-02	B2-04	gw_depth = 02	Study Area	N	Y
B2-04-GW-03	B2-04	gw_depth = 03	Study Area	N	Y
B2-05-GW-01	B2-05	gw_depth = 01	Study Area	Y	Y
B2-05-GW-02*	B2-05	gw_depth = 02	Study Area	N	Y
B2-05-GW-03	B2-05	gw_depth = 03	Study Area	N	Y
B2-05-GW-03NS	B2-05	gw_depth = 03	Study Area	N	Y
CB2-05-GW-02	B2-05	gw_depth = 02	Study Area	N	Y
CB2-05-GW-03R	B2-05	gw_depth = 03	Study Area	N	Y
B2-06-GW-01NS	B2-06	gw_depth = 01	Study Area	Y	Y
B2-06-GW-02*	B2-06	gw_depth = 02	Study Area	N	Y
B2-06-GW-03	B2-06	gw_depth = 03	Study Area	N	Y
CB2-06-GW-02NS	B2-06	gw_depth = 02	Study Area	N	Y
B3-01-GW-01	B3-01	gw_depth = 01	Study Area	Y	Y
B3-01-GW-02	B3-01	gw_depth = 02	Study Area	N	Y
B3-01-GW-03	B3-01	gw_depth = 03	Study Area	N	Y
B3-02-GW-01	B3-02	gw_depth = 01	Study Area	Y	Y
CB3-02-GW-01NS	B3-02	gw_depth = 01	Study Area	Y	Y
B3-02-GW-03	B3-02	gw_depth = 03	Study Area	N	Y
CB3-02-GW-03	B3-02	gw_depth = 03	Study Area	N	Y
B3-03-GW-01	B3-03	gw_depth = 01	Study Area	Y	Y
B3-03-GW-02	B3-03	gw_depth = 02	Study Area	N	Y
B3-03-GW-02R	B3-03	gw_depth = 02	Study Area	N	Y
B3-03-GW-03	B3-03	gw_depth = 03	Study Area	N	Y
CB3-03-GW-03	B3-03	gw_depth = 03	Study Area	N	Y
B3-04-GW-01NS-032601	B3-04	gw_depth = 01	Study Area	Y	Y
B3-04-GW-01NS-041701	B3-04	gw_depth = 01	Study Area	Y	Y
B3-04-GW-01NS-041801	B3-04	gw_depth = 01	Study Area	Y	Y
B3-04-GW-01NS-041901	B3-04	gw_depth = 01	Study Area	Y	Y
B3-06-GW-01	B3-06	gw_depth = 01	Study Area	Y	Y
B3-06-GW-02	B3-06	gw_depth = 02	Study Area	N	Y
B3-06-GW-03	B3-06	gw_depth = 03	Study Area	N	Y
B4-01-GW-01	B4-01	gw_depth = 01	Study Area	Y	Y
B4-01-GW-02R	B4-01	gw_depth = 02	Study Area	N	Y
B4-01-GW-0299	B4-01	gw_depth = 02	Study Area	N	Y
B4-01-GW-03	B4-01	gw_depth = 03	Study Area	N	Y
B4-02-GW-01	B4-02	gw_depth = 01	Study Area	Y	Y
B4-02-GW-02	B4-02	gw_depth = 02	Study Area	N	Y
B4-02-GW-03	B4-02	gw_depth = 03	Study Area	N	Y
B4-03-GW-01	B4-03	gw_depth = 01	Study Area	Y	Y
B4-03-GW-02R*	B4-03	gw_depth = 02	Study Area	N	Y
B4-03-GW-03	B4-03	gw_depth = 03	Study Area	N	Y
CB4-03-GW-03	B4-03	gw_depth = 03	Study Area	N	Y
B4-04-GW-01	B4-04	gw_depth = 01	Study Area	Y	Y
CB4-04-GW-01NS	B4-04	gw_depth = 01	Study Area	Y	Y
B4-04-GW-02	B4-04	gw_depth = 02	Study Area	N	Y
B4-04-GW-03	B4-04	gw_depth = 03	Study Area	N	Y
CB4-04-GW-02NS	B4-04	gw_depth = 02	Study Area	N	Y
B4-05-GW-01	B4-05	gw_depth = 01	Study Area	Y	Y
B4-05-GW-02	B4-05	gw_depth = 02	Study Area	N	Y
B4-05-GW-03	B4-05	gw_depth = 03	Study Area	N	Y
CB4-05-GW-03NS	B4-05	gw_depth = 03	Study Area	N	Y
B5-01-GW-01	B5-01	gw_depth = 01	Study Area	Y	Y
CB5-01-GW-01	B5-01	gw_depth = 01	Study Area	Y	Y
B5-01-GW-02	B5-01	gw_depth = 02	Study Area	N	Y
B5-01-GW-02R	B5-01	gw_depth = 02	Study Area	N	Y
B5-01-GW-03	B5-01	gw_depth = 03	Study Area	N	Y
B5-02-GW-01	B5-02	gw_depth = 01	Study Area	Y	Y
B5-02-GW-02	B5-02	gw_depth = 02	Study Area	N	Y
B5-02-GW-03	B5-02	gw_depth = 03	Study Area	N	Y
CB5-02-GW-02	B5-02	gw_depth = 02	Study Area	N	Y

Table 5. Applicability of Groundwater Samples For Human Health Risk Assessment

Sample ID	Location	Approximate Screen Depth ¹	Data Grouping	Shallow Groundwater for Future Human Health?	Combined Groundwater for Future Human Health?
CB5-02-GW-03	B5-02	gw_depth = 03	Study Area	N	Y
B5-03-GW-01NS-091200	B5-03	gw_depth = 01	Study Area	Y	Y
B5-03-GW-01NS-091300	B5-03	gw_depth = 01	Study Area	Y	Y
B5-03-GW-02	B5-03	gw_depth = 02	Study Area	N	Y
B5-03-GW-03	B5-03	gw_depth = 03	Study Area	N	Y
CB5-03-GW-03	B5-03	gw_depth = 03	Study Area	N	Y
B5-06-GW-01NS	B5-06	gw_depth = 01	Study Area	Y	Y
B5-06-GW-01R	B5-06	gw_depth = 01	Study Area	Y	Y
B5-06-GW-02R	B5-06	gw_depth = 02	Study Area	N	Y
B5-06-GW-03R	B5-06	gw_depth = 03	Study Area	N	Y
B6-01-GW-01	B6-01	gw_depth = 01	Study Area	Y	Y
B6-01-GW-02R	B6-01	gw_depth = 02	Study Area	N	Y
B6-01-GW-03	B6-01	gw_depth = 03	Study Area	N	Y
B6-02-GW-01	B6-02	gw_depth = 01	Study Area	Y	Y
B6-02-GW-02	B6-02	gw_depth = 02	Study Area	N	Y
B6-02-GW-03	B6-02	gw_depth = 03	Study Area	N	Y
B6-03-GW-01	B6-03	gw_depth = 01	Study Area	Y	Y
B6-03-GW-02	B6-03	gw_depth = 02	Study Area	N	Y
B6-03-GW-03	B6-03	gw_depth = 03	Study Area	N	Y
CB6-03-GW-01	B6-03	gw_depth = 01	Study Area	Y	Y
CB6-03-GW-02	B6-03	gw_depth = 02	Study Area	N	Y
CB6-03-GW-03	B6-03	gw_depth = 03	Study Area	N	Y
B6-04-GW-01NS	B6-04	gw_depth = 01	Study Area	Y	Y
B6-04-GW-02RNS	B6-04	gw_depth = 02	Study Area	N	Y
B6-04-GW-03RNS	B6-04	gw_depth = 03	Study Area	N	Y
B6-05-GW-01	B6-05	gw_depth = 01	Study Area	Y	Y
B6-05-GW-02	B6-05	gw_depth = 02	Study Area	N	Y
B6-05-GW-03NS	B6-05	gw_depth = 03	Study Area	N	Y
B7-01-GW-01*	B7-01	gw_depth = 01	Study Area	Y	Y
B7-01-GW-02	B7-01	gw_depth = 02	Study Area	N	Y
B7-01-GW-02R	B7-01	gw_depth = 02	Study Area	N	Y
B7-01-GW-03	B7-01	gw_depth = 03	Study Area	N	Y
CB7-01-GW-01	B7-01	gw_depth = 01	Study Area	Y	Y
CB7-01-GW-03	B7-01	gw_depth = 03	Study Area	N	Y
B7-02-GW-01NS	B7-02	gw_depth = 01	Study Area	N ³	N ³
B7-02-GW-02	B7-02	gw_depth = 02	Study Area	N	Y
B7-02-GW-03NS	B7-02	gw_depth = 03	Study Area	N ³	N ³
CB7-02-GW-01	B7-02	gw_depth = 01	Study Area	Y	Y
CB7-02-GW-02	B7-02	gw_depth = 02	Study Area	N	Y
B7-03-GW-01	B7-03	gw_depth = 01	Study Area	Y	Y
B7-03-GW-02R*	B7-03	gw_depth = 02	Study Area	N	Y
B7-03-GW-03	B7-03	gw_depth = 03	Study Area	N	Y
CB7-03-GW-01	B7-03	gw_depth = 01	Study Area	Y	Y
CB7-03-GW-02R	B7-03	gw_depth = 02	Study Area	N	Y
CB7-03-GW-03	B7-03	gw_depth = 03	Study Area	N	Y
B7-04-GW-01	B7-04	gw_depth = 01	Study Area	Y	Y
B7-04-GW-02	B7-04	gw_depth = 02	Study Area	N	Y
B7-04-GW-03	B7-04	gw_depth = 03	Study Area	N	Y
B7-05-GW-01	B7-05	gw_depth = 01	Study Area	Y	Y
B7-05-GW-02R	B7-05	gw_depth = 02	Study Area	N	Y
B7-05-GW-03NS	B7-05	gw_depth = 03	Study Area	N	Y
B7-06-GW-01	B7-06	gw_depth = 01	Study Area	Y	Y
B7-06-GW-02*	B7-06	gw_depth = 02	Study Area	N	Y
B7-06-GW-03	B7-06	gw_depth = 03	Study Area	N	Y
B7-07-GW-01	B7-07	gw_depth = 01	Study Area	Y	Y
B7-07-GW-02	B7-07	gw_depth = 02	Study Area	N	Y
B7-07-GW-03	B7-07	gw_depth = 03	Study Area	N	Y
B8-01-GW-01*	B8-01	gw_depth = 01	Study Area	Y	Y
CB8-01-GW-01*	B8-01	gw_depth = 01	Study Area	Y	Y
B8-01-GW-02R	B8-01	gw_depth = 02	Study Area	N	Y
B8-01-GW-03NS	B8-01	gw_depth = 03	Study Area	N	Y
CB8-01-GW-03	B8-01	gw_depth = 03	Study Area	N	Y
B8-02-GW-01	B8-02	gw_depth = 01	Study Area	Y	Y
B8-02-GW-02NS-022201	B8-02	gw_depth = 02	Study Area	N ³	N ³
B8-02-GW-02NS-030101	B8-02	gw_depth = 02	Study Area	N ³	N ³
B8-02-GW-03NS-022101	B8-02	gw_depth = 03	Study Area	N ³	N ³
B8-02-GW-03NS-030101	B8-02	gw_depth = 03	Study Area	N ³	N ³
B8-03-GW-01	B8-03	gw_depth = 01	Study Area	Y	Y
B8-03-GW-02R	B8-03	gw_depth = 02	Study Area	N	Y
B8-03-GW-03NS	B8-03	gw_depth = 03	Study Area	N	Y
B8-04-GW-01	B8-04	gw_depth = 01	Study Area	Y	Y
B8-04-GW-02	B8-04	gw_depth = 02	Study Area	N	Y
B8-04-GW-03	B8-04	gw_depth = 03	Study Area	N	Y
CB8-04-GW-02NS*	B8-04	gw_depth = 02	Study Area	N	Y
B8-05-GW-01	B8-05	gw_depth = 01	Study Area	Y	Y

Table 5. Applicability of Groundwater Samples For Human Health Risk Assessment

Sample ID	Location	Approximate Screen Depth ¹	Data Grouping	Shallow Groundwater for Future Human Health?	Combined Groundwater for Future Human Health?
B8-05-GW-02R	B8-05	gw_depth = 02	Study Area	N	Y
B8-05-GW-03	B8-05	gw_depth = 03	Study Area	N	Y
B8-06-GW-01NS	B8-06	gw_depth = 01	Study Area	Y	Y
B8-06-GW-01RNS	B8-06	gw_depth = 01	Study Area	Y	Y
B8-06-GW-02R*	B8-06	gw_depth = 02	Study Area	N	Y
B8-06-GW-03R	B8-06	gw_depth = 03	Study Area	N	Y
B9-01-GW-01	B9-01	gw_depth = 01	Study Area	Y	Y
B9-01-GW-02*	B9-01	gw_depth = 02	Study Area	N	Y
B9-01-GW-03*	B9-01	gw_depth = 03	Study Area	N	Y
CB9-01-GW-01	B9-01	gw_depth = 01	Study Area	Y	Y
CB9-01-GW-03	B9-01	gw_depth = 03	Study Area	N	Y
B9-02-GW-01	B9-02	gw_depth = 01	Study Area	Y	Y
B9-02-GW-02	B9-02	gw_depth = 02	Study Area	N	Y
B9-02-GW-03	B9-02	gw_depth = 03	Study Area	N	Y
CB9-02-GW-02	B9-02	gw_depth = 02	Study Area	N	Y
B9-03-GW-01	B9-03	gw_depth = 01	Study Area	Y	Y
B9-03-GW-02RNS	B9-03	gw_depth = 02	Study Area	N	Y
B9-03-GW-03NS	B9-03	gw_depth = 03	Study Area	N	Y
B9-04-GW-01	B9-04	gw_depth = 01	Study Area	Y	Y
CB9-04-GW-01	B9-04	gw_depth = 01	Study Area	Y	Y
B9-04-GW-02	B9-04	gw_depth = 02	Study Area	N	Y
B9-04-GW-03	B9-04	gw_depth = 03	Study Area	N	Y
B9-05-GW-01	B9-05	gw_depth = 01	Study Area	Y	Y
CB9-05-GW-01	B9-05	gw_depth = 01	Study Area	Y	Y
B9-05-GW-02	B9-05	gw_depth = 02	Study Area	N	Y
B9-05-GW-03	B9-05	gw_depth = 03	Study Area	N	Y
B9-06-GW-01*	B9-06	gw_depth = 01	Study Area	Y	Y
B9-06-GW-02	B9-06	gw_depth = 02	Study Area	N	Y
B9-06-GW-03	B9-06	gw_depth = 03	Study Area	N	Y
E3-01-GW-01	E3-01	gw_depth = 01	Study Area	Y	Y
E3-01-GW-02	E3-01	gw_depth = 02	Study Area	N	Y
E3-01-GW-03	E3-01	gw_depth = 03	Study Area	N	Y
CE3-02-GW-03	E3-02	gw_depth = 03	Study Area	N	Y
E3-02-GW-01	E3-02	gw_depth = 01	Study Area	Y	Y
E3-02-GW-02	E3-02	gw_depth = 02	Study Area	N	Y
E3-02-GW-03	E3-02	gw_depth = 03	Study Area	N	Y
E3-03-GW-01	E3-03	gw_depth = 01	Study Area	Y	Y
E3-03-GW-02	E3-03	gw_depth = 02	Study Area	N	Y
E3-03-GW-03-020501	E3-03	gw_depth = 03	Study Area	N	Y
E3-03-GW-03R*	E3-03	gw_depth = 03	Study Area	N	Y
E4-01-GW-01	E4-01	gw_depth = 01	Study Area	Y	Y
E4-01-GW-02-101100	E4-01	gw_depth = 02	Study Area	N	Y
E4-01-GW-02R	E4-01	gw_depth = 02	Study Area	N	Y
E4-01-GW-03	E4-01	gw_depth = 03	Study Area	N	Y
CE4-02-GW-01	E4-02	gw_depth = 01	Study Area	Y	Y
E4-02-GW-01NS-020501	E4-02	gw_depth = 01	Study Area	Y	Y
E4-02-GW-01NS-020701	E4-02	gw_depth = 01	Study Area	Y	Y
E4-02-GW-01NS-020801	E4-02	gw_depth = 01	Study Area	Y	Y
E4-02-GW-01NS-020901	E4-02	gw_depth = 01	Study Area	Y	Y
E4-02-GW-02	E4-02	gw_depth = 02	Study Area	N	Y
E4-02-GW-03	E4-02	gw_depth = 03	Study Area	N	Y
CE4-03-GW-01NS-072301	E4-03	gw_depth = 01	Study Area	Y	Y
CE4-03-GW-01NS-072401	E4-03	gw_depth = 01	Study Area	Y	Y
CE4-03-GW-03*	E4-03	gw_depth = 03	Study Area	N	Y
E4-03-GW-01NS-020501	E4-03	gw_depth = 01	Study Area	Y	Y
E4-03-GW-01NS-020701	E4-03	gw_depth = 01	Study Area	Y	Y
E4-03-GW-01NS-020801	E4-03	gw_depth = 01	Study Area	Y	Y
E4-03-GW-01NS-020901	E4-03	gw_depth = 01	Study Area	Y	Y
E4-03-GW-02NS	E4-03	gw_depth = 02	Study Area	N	Y
E4-03-GW-03	E4-03	gw_depth = 03	Study Area	N	Y
E4-04-GW-01NS-020201	E4-04	gw_depth = 01	Study Area	Y	Y
E4-04-GW-01NS-020501	E4-04	gw_depth = 01	Study Area	Y	Y
E4-04-GW-01NS-020701	E4-04	gw_depth = 01	Study Area	Y	Y
E4-04-GW-02	E4-04	gw_depth = 02	Study Area	N	Y
E4-04-GW-03	E4-04	gw_depth = 03	Study Area	N	Y
H1-01-GW-01	H1-01	gw_depth = 01	Study Area	Y	Y
H1-01-GW-02*	H1-01	gw_depth = 02	Study Area	N	Y
H1-01-GW-03*	H1-01	gw_depth = 03	Study Area	N	Y
H1-02-GW-01	H1-02	gw_depth = 01	Study Area	Y	Y
H1-02-GW-02	H1-02	gw_depth = 02	Study Area	N	Y
H1-03-GW-01*	H1-03	gw_depth = 01	Study Area	Y	Y
H1-03-GW-02*	H1-03	gw_depth = 02	Study Area	N	Y
H1-03-GW-03	H1-03	gw_depth = 03	Study Area	N	Y
H1-03-GW-04	H1-03	gw_depth = 04	Study Area	N	Y
H1-03-GW-05NS-020701	H1-03	gw_depth = 05	Study Area	N	Y
H1-03-GW-05R	H1-03	gw_depth = 05	Study Area	N	Y

Table 5. Applicability of Groundwater Samples For Human Health Risk Assessment

Sample ID	Location	Approximate Screen Depth ¹	Data Grouping	Shallow Groundwater for Future Human Health?	Combined Groundwater for Future Human Health?
H1-03-GW-06NS	H1-03	gw_depth = 06	Study Area	N	Y
CH1-04-GW-04	H1-04	gw_depth = 04	Study Area	N	Y
CH1-04-GW-05R	H1-04	gw_depth = 05	Study Area	N	Y
H1-04-GW-01	H1-04	gw_depth = 01	Study Area	Y	Y
H1-04-GW-02	H1-04	gw_depth = 02	Study Area	N	Y
H1-04-GW-03	H1-04	gw_depth = 03	Study Area	N	Y
H1-04-GW-04NS-012601	H1-04	gw_depth = 04	Study Area	N	Y
H1-04-GW-04NS-013101	H1-04	gw_depth = 04	Study Area	N	Y
H1-04-GW-04NS-020101	H1-04	gw_depth = 04	Study Area	N	Y
H1-04-GW-05NS-020701	H1-04	gw_depth = 05	Study Area	N	Y
H1-04-GW-05NS-020801	H1-04	gw_depth = 05	Study Area	N	Y
H1-04-GW-05R	H1-04	gw_depth = 05	Study Area	N	Y
H1-04-GW-06NS	H1-04	gw_depth = 06	Study Area	N	Y
H1-05-GW-01	H1-05	gw_depth = 01	Study Area	Y	Y
H1-05-GW-02*	H1-05	gw_depth = 02	Study Area	N	Y
H1-06-GW-01	H1-06	gw_depth = 01	Study Area	Y	Y
H1-06-GW-02	H1-06	gw_depth = 02	Study Area	N	Y
H1-07-GW-01*	H1-07	gw_depth = 01	Study Area	Y	Y
H1-07-GW-02	H1-07	gw_depth = 02	Study Area	N	Y
H1-07-GW-03	H1-07	gw_depth = 03	Study Area	N	Y
H2-01-GW-01NS	H2-01	gw_depth = 01	Study Area	Y	Y
H2-01-GW-02NS	H2-01	gw_depth = 02	Study Area	N	Y
CH2-02-GW-02	H2-02	gw_depth = 02	Study Area	N	Y
CH2-02-GW-05	H2-02	gw_depth = 05	Study Area	N	Y
H2-02-GW-01	H2-02	gw_depth = 01	Study Area	Y	Y
H2-02-GW-02	H2-02	gw_depth = 02	Study Area	N	Y
H2-02-GW-03	H2-02	gw_depth = 03	Study Area	N	Y
H2-02-GW-04	H2-02	gw_depth = 04	Study Area	N	Y
H2-02-GW-05	H2-02	gw_depth = 05	Study Area	N	Y
H2-03-GW-01	H2-03	gw_depth = 01	Study Area	Y	Y
H2-03-GW-02	H2-03	gw_depth = 02	Study Area	N	Y
H2-03-GW-03	H2-03	gw_depth = 03	Study Area	N	Y
H2-03-GW-04	H2-03	gw_depth = 04	Study Area	N	Y
H2-03-GW-05*	H2-03	gw_depth = 05	Study Area	N	Y
H2-03-GW-06	H2-03	gw_depth = 06	Study Area	N	Y
CH2-04-GW-05	H2-04	gw_depth = 05	Study Area	N	Y
CH2-04-GW-06	H2-04	gw_depth = 06	Study Area	N	Y
H2-04-GW-01	H2-04	gw_depth = 01	Study Area	Y	Y
H2-04-GW-02	H2-04	gw_depth = 02	Study Area	N	Y
H2-04-GW-03	H2-04	gw_depth = 03	Study Area	N	Y
H2-04-GW-04	H2-04	gw_depth = 04	Study Area	N	Y
H2-04-GW-05	H2-04	gw_depth = 05	Study Area	N	Y
H2-04-GW-06NS	H2-04	gw_depth = 06	Study Area	N	Y
H2-04-GW-07	H2-04	gw_depth = 07	Study Area	N	Y
H2-05-GW-01	H2-05	gw_depth = 01	Study Area	Y	Y
H2-05-GW-02	H2-05	gw_depth = 02	Study Area	N	Y
H2-05-GW-03	H2-05	gw_depth = 03	Study Area	N	Y
H2-05-GW-04	H2-05	gw_depth = 04	Study Area	N	Y
H2-05-GW-05	H2-05	gw_depth = 05	Study Area	N	Y
H2-05-GW-06	H2-05	gw_depth = 06	Study Area	N	Y
H2-05-GW-07	H2-05	gw_depth = 07	Study Area	N	Y
H2-06-GW-01	H2-06	gw_depth = 01	Study Area	Y	Y
H2-06-GW-02	H2-06	gw_depth = 02	Study Area	N	Y
H2-06-GW-03	H2-06	gw_depth = 03	Study Area	N	Y
H2-06-GW-04*	H2-06	gw_depth = 04	Study Area	N	Y
H2-06-GW-05*	H2-06	gw_depth = 05	Study Area	N	Y
H2-06-GW-06	H2-06	gw_depth = 06	Study Area	N	Y
H2-06-GW-07*	H2-06	gw_depth = 07	Study Area	N	Y
L2-01-GW-01	L2-01	gw_depth = 01	Study Area	Y	Y
L2-01-GW-02	L2-01	gw_depth = 02	Study Area	N	Y
L2-01-GW-03*	L2-01	gw_depth = 03	Study Area	N	Y
L2-01-GW-04	L2-01	gw_depth = 04	Study Area	N	Y
L2-01-GW-05*	L2-01	gw_depth = 05	Study Area	N	Y
L2-01-GW-06	L2-01	gw_depth = 06	Study Area	N	Y
L2-01-GW-07	L2-01	gw_depth = 07	Study Area	N	Y
L2-02-GW-01	L2-02	gw_depth = 01	Study Area	Y	Y
L2-02-GW-02	L2-02	gw_depth = 02	Study Area	N	Y
L2-02-GW-03	L2-02	gw_depth = 03	Study Area	N	Y
L2-02-GW-04NS	L2-02	gw_depth = 04	Study Area	N	Y
L2-02-GW-05	L2-02	gw_depth = 05	Study Area	N	Y
CL2-03-GW-01	L2-03	gw_depth = 01	Study Area	Y	Y
CL2-03-GW-02*	L2-03	gw_depth = 02	Study Area	N	Y
L2-03-GW-01NS	L2-03	gw_depth = 01	Study Area	Y	Y
L2-03-GW-02NS	L2-03	gw_depth = 02	Study Area	N	Y
L2-03-GW-03	L2-03	gw_depth = 03	Study Area	N	Y
L2-03-GW-04*	L2-03	gw_depth = 04	Study Area	N	Y

Table 5. Applicability of Groundwater Samples For Human Health Risk Assessment

Sample ID	Location	Approximate Screen Depth ¹	Data Grouping	Shallow Groundwater for Future Human Health?	Combined Groundwater for Future Human Health?
L2-04-GW-01NS	L2-04	gw_depth = 01	Study Area	Y	Y
L2-04-GW-02	L2-04	gw_depth = 02	Study Area	N	Y
L2-04-GW-03	L2-04	gw_depth = 03	Study Area	N	Y
CL2-05-GW-01NS	L2-05	gw_depth = 01	Study Area	Y	Y
CL2-05-GW-03	L2-05	gw_depth = 03	Study Area	N	Y
L2-05-GW-01	L2-05	gw_depth = 01	Study Area	Y	Y
L2-05-GW-02*	L2-05	gw_depth = 02	Study Area	N	Y
L2-05-GW-03	L2-05	gw_depth = 03	Study Area	N	Y
IPGW-MW04-0012-032502	MW04	15' - 24.5'	Study Area	N	Y
IPGW-MW04-0014-032802	MW04	8' - 18'	Study Area	Y	Y
IPGW-MW04-0023-032802	MW04	15' - 24.5'	Study Area	N	Y
IPGW-MW04-0036-032802	MW04	36'	Study Area	N	Y
P1-01-GW-01-041201	P1-01	gw_depth = 01	Study Area	Y	Y
P1-01-GW-01R	P1-01	gw_depth = 01	Study Area	Y	Y
P1-01-GW-02	P1-01	gw_depth = 02	Study Area	N	N ²
P1-01-GW-02R	P1-01	gw_depth = 02	Study Area	N	Y
P1-01-GW-03	P1-01	gw_depth = 03	Study Area	N	Y
P1-01-GW-03NS-042601	P1-01	gw_depth = 03	Study Area	N	Y
P1-01-GW-03NS-043001	P1-01	gw_depth = 03	Study Area	N	Y
P1-01-GW-03NS-050701	P1-01	gw_depth = 03	Study Area	N	Y
P1-01-GW-03R	P1-01	gw_depth = 03	Study Area	N	Y
P1-01-GW-04R	P1-01	gw_depth = 04	Study Area	N	Y
P1-01-GW-05R*	P1-01	gw_depth = 05	Study Area	N	Y
P1-01-GW-06NS-110701	P1-01	gw_depth = 06	Study Area	N ³	N ³
P1-01-GW-06R2NS	P1-01	gw_depth = 06	Study Area	N	Y
P1-01-GW-07NS	P1-01	gw_depth = 07	Study Area	N	Y
P1-01-GW-08NS-111301	P1-01	gw_depth = 08	Study Area	N ³	N ³
P1-01-GW-08R2NS-020602	P1-01	gw_depth = 08	Study Area	N	Y
P1-01-GW-08R2NS-020802	P1-01	gw_depth = 08	Study Area	N	Y
P1-02-GW-01	P1-02	gw_depth = 01	Study Area	Y	Y
P1-02-GW-02	P1-02	gw_depth = 02	Study Area	N	Y
P1-02-GW-03	P1-02	gw_depth = 03	Study Area	N	Y
P1-02-GW-04*	P1-02	gw_depth = 04	Study Area	N	Y
P1-02-GW-05NS-110501	P1-02	gw_depth = 05	Study Area	N ³	N ^{2,3}
P1-02-GW-05R2NS	P1-02	gw_depth = 05	Study Area	N	Y
P1-02-GW-06NS-110601	P1-02	gw_depth = 06	Study Area	N ³	N ^{2,3}
P1-02-GW-06R2NS	P1-02	gw_depth = 06	Study Area	N	Y
P1-02-GW-07NS	P1-02	gw_depth = 07	Study Area	N ³	N ³
P1-03-GW-01	P1-03	gw_depth = 01	Study Area	Y	Y
P1-03-GW-02	P1-03	gw_depth = 02	Study Area	N	Y
P1-03-GW-03	P1-03	gw_depth = 03	Study Area	N	Y
P1-03-GW-04	P1-03	gw_depth = 04	Study Area	N	Y
P1-03-GW-05NS	P1-03	gw_depth = 05	Study Area	N	Y
P1-03-GW-06NS-051601	P1-03	gw_depth = 06	Study Area	N ³	N ³
P1-03-GW-06NS-111201	P1-03	gw_depth = 06	Study Area	N ³	N ³
P1-04-GW-01	P1-04	gw_depth = 01	Study Area	Y	Y
P1-04-GW-02*	P1-04	gw_depth = 02	Study Area	N	Y
P1-04-GW-03	P1-04	gw_depth = 03	Study Area	N	Y
P1-04-GW-04	P1-04	gw_depth = 04	Study Area	N	Y
P1-05-GW-01	P1-05	gw_depth = 01	Study Area	Y	Y
P1-05-GW-02	P1-05	gw_depth = 02	Study Area	N	Y
P1-05-GW-03	P1-05	gw_depth = 03	Study Area	N	Y
P1-05-GW-04NS	P1-05	gw_depth = 04	Study Area	N	Y
P1-05-GW-05	P1-05	gw_depth = 05	Study Area	N	Y
P1-06-GW-01	P1-06	gw_depth = 01	Study Area	Y	Y
P1-06-GW-02	P1-06	gw_depth = 02	Study Area	N	Y
P1-06-GW-03	P1-06	gw_depth = 03	Study Area	N	Y
P1-06-GW-04	P1-06	gw_depth = 04	Study Area	N	Y
P1-07-GW-01*	P1-07	gw_depth = 01	Study Area	Y	Y
P1-07-GW-02	P1-07	gw_depth = 02	Study Area	N	Y
P1-07-GW-03NS-043001	P1-07	gw_depth = 03	Study Area	N	Y
P1-07-GW-03NS-050701	P1-07	gw_depth = 03	Study Area	N	Y
P1-07-GW-03NS-073101	P1-07	gw_depth = 03	Study Area	N	Y
P1-07-GW-03NS-080101	P1-07	gw_depth = 03	Study Area	N	Y
P1-07-GW-03NS-080301	P1-07	gw_depth = 03	Study Area	N	Y
W5-01-GW-01	W5-01	gw_depth = 01	Study Area	Y	Y
W5-01-GW-02	W5-01	gw_depth = 02	Study Area	N	Y
W5-01-GW-02R	W5-01	gw_depth = 02	Study Area	N	Y
W5-01-GW-03	W5-01	gw_depth = 03	Study Area	N	Y
W5-02-GW-01	W5-02	gw_depth = 01	Study Area	Y	Y
W5-02-GW-02-100300	W5-02	gw_depth = 02	Study Area	N	Y
W5-02-GW-02R	W5-02	gw_depth = 02	Study Area	N	Y
W5-02-GW-03	W5-02	gw_depth = 03	Study Area	N	Y
CW5-03-GW-01	W5-03	gw_depth = 01	Study Area	Y	Y

Table 5. Applicability of Groundwater Samples For Human Health Risk Assessment

Sample ID	Location	Approximate Screen Depth ¹	Data Grouping	Shallow Groundwater for Future Human Health?	Combined Groundwater for Future Human Health?
CW5-03-GW-02R*	W5-03	gw_depth = 02	Study Area	N	Y
CW5-03-GW-03NS	W5-03	gw_depth = 03	Study Area	N	Y
W5-03-GW-01	W5-03	gw_depth = 01	Study Area	Y	Y
W5-03-GW-02	W5-03	gw_depth = 02	Study Area	N	Y
W5-03-GW-02R	W5-03	gw_depth = 02	Study Area	N	Y
W5-03-GW-03	W5-03	gw_depth = 03	Study Area	N	Y
W5-04-GW-01	W5-04	gw_depth = 01	Study Area	Y	Y
W5-04-GW-02	W5-04	gw_depth = 02	Study Area	N	Y
W5-04-GW-03-072701	W5-04	gw_depth = 03	Study Area	N	Y
W5-04-GW-03-100500	W5-04	gw_depth = 03	Study Area	N	Y
CW5-05-GW-02R	W5-05	gw_depth = 02	Study Area	N	Y
CW5-05-GW-03	W5-05	gw_depth = 03	Study Area	N	Y
W5-05-GW-01	W5-05	gw_depth = 01	Study Area	Y	Y
W5-05-GW-02	W5-05	gw_depth = 02	Study Area	N	Y
W5-05-GW-02R	W5-05	gw_depth = 02	Study Area	N	Y
W5-05-GW-03	W5-05	gw_depth = 03	Study Area	N	Y
W5-06-GW-01	W5-06	gw_depth = 01	Study Area	Y	Y
W5-06-GW-02-100400	W5-06	gw_depth = 02	Study Area	N	Y
W5-06-GW-02RNS	W5-06	gw_depth = 02	Study Area	N	Y
W5-06-GW-03-073101	W5-06	gw_depth = 03	Study Area	N	Y
W5-06-GW-03-100500	W5-06	gw_depth = 03	Study Area	N	Y
W5-07-GW-01*	W5-07	gw_depth = 01	Study Area	Y	Y
W5-07-GW-02	W5-07	gw_depth = 02	Study Area	N	Y
W5-07-GW-03	W5-07	gw_depth = 03	Study Area	N	Y
CW5-08-GW-01	W5-08	gw_depth = 01	Study Area	Y	Y
W5-08-GW-01NS	W5-08	gw_depth = 01	Study Area	N ³	N ³
W5-08-GW-02	W5-08	gw_depth = 02	Study Area	N	Y
W5-08-GW-03	W5-08	gw_depth = 03	Study Area	N	Y
RX-1S	RX-1	10' - 15'	Study Area	Y	Y
RX-1D	RX-1	30'	Study Area	N	Y
RX-2S	RX-2	15'	Study Area	Y	Y
RX-2D	RX-2	33'	Study Area	N	Y
RX-3S	RX-3	10' - 15'	Study Area	Y	Y
RX-3D	RX-3	17' - 23'	Study Area	N	Y
RX-4S	RX-4	15'	Study Area	Y	Y
RX-4D	RX-4	24' - 29'	Study Area	N	Y
RX-5S	RX-5	10' - 15'	Study Area	Y	Y
RX-5D	RX-5	24' - 29'	Study Area	N	Y
RX-6S	RX-6	15'	Study Area	Y	Y
RX-6D	RX-6	24' - 29'	Study Area	N	Y
RX-7S	RX-7	10' - 15'	Study Area	Y	Y
RX-7D*	RX-7	26' - 31'	Study Area	N	Y
RX-8S	RX-8	11' - 15'	Study Area	Y	Y
RX-8D	RX-8	31'	Study Area	N	Y
RX-9S*	RX-9	10' - 15'	Study Area	Y	Y
RX-9D	RX-9	28' - 33'	Study Area	N	Y
RX-10S	RX-10	10' - 15'	Study Area	Y	Y
RX-10D	RX-10	20' - 25'	Study Area	N	Y
RX-11S	RX-11	10' - 15'	Study Area	Y	Y
RX-11D	RX-11	26' - 31'	Study Area	N	Y
RX-12S	RX-12	10' - 15'	Study Area	Y	Y
RX-12D	RX-12	26' - 31'	Study Area	N	Y
RX-13S	RX-13	10' - 15'	Study Area	Y	Y
RX-13D	RX-13	24' - 29'	Study Area	N	Y
RX-14S*	RX-14	10' - 15'	Study Area	Y	Y
RX-14D	RX-14	24' - 29'	Study Area	N	Y
RX-15S	RX-15	10' - 15'	Study Area	Y	Y
RX-15D	RX-15	24' - 29'	Study Area	N	Y
RX-16S	RX-16	10' - 15'	Study Area	Y	Y
RX-16D	RX-16	24' - 29'	Study Area	N	Y
RX-17S	RX-17	10' - 15'	Study Area	Y	Y
RX-17D	RX-17	28' - 33'	Study Area	N	Y
RX-18S*	RX-18	8' - 13'	Study Area	Y	Y
RX-18I	RX-18	15' - 20'	Study Area	N	Y
RX-18D	RX-18	25' - 30'	Study Area	N	Y
RX-19S	RX-19	13'	Study Area	Y	Y
RX-19I	RX-19	17' - 22'	Study Area	N	Y
RX-19D	RX-19	25' - 30'	Study Area	N	Y
B3-05-GW-01	B3-05	gw_depth = 01	Class A	Y	Y
B5-04-GW-01	B5-04	gw_depth = 01	Class A	Y	Y
B5-05-GW-01	B5-05	gw_depth = 01	Class A	Y	Y
IPGW-CA02-0007-012502	CA02	5' - 13'	Class A	Y	Y
IPGW-CA03-0005-011102	CA03	1' - 11'	Class A	Y	Y
IPGW-CA03-0012-011102	CA03	12'	Class A	N	Y
IPGW-CA03-0016-011102	CA03	16'	Class A	N	Y

Table 5. Applicability of Groundwater Samples For Human Health Risk Assessment

Sample ID	Location	Approximate Screen Depth ¹	Data Grouping	Shallow Groundwater for Future Human Health?	Combined Groundwater for Future Human Health?
IPGW-CA04-0004-011402	CA04	1' - 6.5'	Class A	Y	Y
IPGW-CA04-0017-011402	CA04	17'	Class A	N	Y
IPGW-CA04-0025-011402*	CA04	25' - 25'	Class A	N	Y
IPGW-CA05-0007-011002*	CA05	3.5' - 13.5'	Class A	Y	Y
IPGW-CA05-0015-011002	CA05	15'	Class A	N	Y
IPGW-CA05-0030-011002	CA05	30'	Class A	N	Y
IPGW-CA06-0007-011402	CA06	1' - 6.3'	Class A	Y	Y
IPGW-CA06-0013-011402	CA06	13'	Class A	N	Y
IPGW-CA06-0023-011402	CA06	23' - 23'	Class A	N	Y
IPGW-CA07-0007-011602*	CA07	4.8' - 7.8'	Class A	Y	Y
IPGW-CA08-0015-010802	CA08	15'	Class A	Y	Y
IPGW-CA09-0012-011002	CA09	10' - 20'	Class A	Y	Y
IPGW-CA09-0016-010902	CA09	16'	Class A	N	Y
IPGW-CA09-0029-011002	CA09	29'	Class A	N	Y
IPGW-AF01-0025-021102	AF01	16' - 26'	P-1/AF	Y	Y
IPGW-AF01-0074-011702	AF01	74'	P-1/AF	N	Y
IPGW-AF01-0115-040802	AF01	115'	P-1/AF	N	Y
IPGW-AF02-0014-032702*	AF02	5' - 15'	P-1/AF	Y	Y
IPGW-AF02-0032-032702	AF02	32'	P-1/AF	N	Y
IPGW-AF02-0075-032602	AF02	75'	P-1/AF	N	Y
IPGW-AF03-0018-022202	AF03	10' - 19.5'	P-1/AF	Y	Y
IPGW-AF03-0037-022502	AF03	37'	P-1/AF	N	Y
IPGW-AF03-0049-022202	AF03	49'	P-1/AF	N	Y
IPGW-AF03-0061-022502*	AF03	61'	P-1/AF	N	Y
P1-01-GW-01-041201	P1-01	gw_depth = 01	P-1/AF	Y	Y
P1-01-GW-01R	P1-01	gw_depth = 01	P-1/AF	Y	Y
P1-01-GW-02	P1-01	gw_depth = 02	P-1/AF	N	N ²
P1-01-GW-02R	P1-01	gw_depth = 02	P-1/AF	N	Y
P1-01-GW-03	P1-01	gw_depth = 03	P-1/AF	N	Y
P1-01-GW-03NS-042601	P1-01	gw_depth = 03	P-1/AF	N	Y
P1-01-GW-03NS-043001	P1-01	gw_depth = 03	P-1/AF	N	Y
P1-01-GW-03NS-050701	P1-01	gw_depth = 03	P-1/AF	N	Y
P1-01-GW-03R	P1-01	gw_depth = 03	P-1/AF	N	Y
P1-01-GW-04R	P1-01	gw_depth = 04	P-1/AF	N	Y
P1-01-GW-05R*	P1-01	gw_depth = 05	P-1/AF	N	Y
P1-01-GW-06NS-110701	P1-01	gw_depth = 06	P-1/AF	N ³	N ³
P1-01-GW-06R2NS	P1-01	gw_depth = 06	P-1/AF	N	Y
P1-01-GW-07NS	P1-01	gw_depth = 07	P-1/AF	N	Y
P1-01-GW-08NS-111301	P1-01	gw_depth = 08	P-1/AF	N ³	N ³
P1-01-GW-08R2NS-020602	P1-01	gw_depth = 08	P-1/AF	N	Y
P1-01-GW-08R2NS-020802	P1-01	gw_depth = 08	P-1/AF	N	Y
P1-02-GW-01	P1-02	gw_depth = 01	P-1/AF	Y	Y
P1-02-GW-02	P1-02	gw_depth = 02	P-1/AF	N	Y
P1-02-GW-03	P1-02	gw_depth = 03	P-1/AF	N	Y
P1-02-GW-04*	P1-02	gw_depth = 04	P-1/AF	N	Y
P1-02-GW-05NS-110501	P1-02	gw_depth = 05	P-1/AF	N ³	N ^{2,3}
P1-02-GW-05R2NS	P1-02	gw_depth = 05	P-1/AF	N	Y
P1-02-GW-06NS-110601	P1-02	gw_depth = 06	P-1/AF	N ³	N ^{2,3}
P1-02-GW-06R2NS	P1-02	gw_depth = 06	P-1/AF	N	Y
P1-02-GW-07NS	P1-02	gw_depth = 07	P-1/AF	N ³	N ³
P1-03-GW-01	P1-03	gw_depth = 01	P-1/AF	Y	Y
P1-03-GW-02	P1-03	gw_depth = 02	P-1/AF	N	Y
P1-03-GW-03	P1-03	gw_depth = 03	P-1/AF	N	Y
P1-03-GW-04	P1-03	gw_depth = 04	P-1/AF	N	Y
P1-03-GW-05NS	P1-03	gw_depth = 05	P-1/AF	N	Y
P1-03-GW-06NS-051601	P1-03	gw_depth = 06	P-1/AF	N ³	N ³
P1-03-GW-06NS-111201	P1-03	gw_depth = 06	P-1/AF	N ³	N ³
P1-04-GW-01	P1-04	gw_depth = 01	P-1/AF	Y	Y
P1-04-GW-02*	P1-04	gw_depth = 02	P-1/AF	N	Y
P1-04-GW-03	P1-04	gw_depth = 03	P-1/AF	N	Y
P1-04-GW-04	P1-04	gw_depth = 04	P-1/AF	N	Y
P1-05-GW-01	P1-05	gw_depth = 01	P-1/AF	Y	Y
P1-05-GW-02	P1-05	gw_depth = 02	P-1/AF	N	Y
P1-05-GW-03	P1-05	gw_depth = 03	P-1/AF	N	Y
P1-05-GW-04NS	P1-05	gw_depth = 04	P-1/AF	N	Y
P1-05-GW-05	P1-05	gw_depth = 05	P-1/AF	N	Y
P1-06-GW-01	P1-06	gw_depth = 01	P-1/AF	Y	Y
P1-06-GW-02	P1-06	gw_depth = 02	P-1/AF	N	Y
P1-06-GW-03	P1-06	gw_depth = 03	P-1/AF	N	Y
P1-06-GW-04	P1-06	gw_depth = 04	P-1/AF	N	Y
P1-07-GW-01*	P1-07	gw_depth = 01	P-1/AF	Y	Y
P1-07-GW-02	P1-07	gw_depth = 02	P-1/AF	N	Y
P1-07-GW-03NS-043001	P1-07	gw_depth = 03	P-1/AF	N	Y

Table 5. Applicability of Groundwater Samples For Human Health Risk Assessment

Sample ID	Location	Approximate Screen Depth ¹	Data Grouping	Shallow Groundwater for Future Human Health?	Combined Groundwater for Future Human Health?
P1-07-GW-03NS-050701	P1-07	gw_depth = 03	P-1/AF	N	Y
P1-07-GW-03NS-073101	P1-07	gw_depth = 03	P-1/AF	N	Y
P1-07-GW-03NS-080101	P1-07	gw_depth = 03	P-1/AF	N	Y
P1-07-GW-03NS-080301	P1-07	gw_depth = 03	P-1/AF	N	Y

Notes

* Sample has a duplicate

1. Screen interval provided if available. Groundwater depth codes run from shallowest (gw_depth = 01) to deepest (gw_depth = 08).
2. Due to an extremely high volume of suspended solids, this sample has been removed from the data set. The well was resampled and the reanalysis ("R") was used in place of the removed data.
3. Sampled with check valve. Removed from data set because this method does not result in a low-flow sample. The high turbidity of samples collected using non-low-flow methods is not considered representative of aquifer conditions.

**Table 6. Human Health Risk Assessment Exposure Frequency Assumptions
Industri-Plex Superfund Site**

Station	Samples Available?		Receptor Population	Exposure Frequency (days/yr)			
	Sediment	Soil		Current		Future	
				RME	CT	RME	CT
HB01/A6	Y	Y	Teenage Recreational User	26	26	52	26
HB02	Y	N	Teenage Recreational User	NE	NE	52	26
HB03	Y	N	Teenage Recreational User	26	26	52	26
AR	Y	N	Teenage Recreational User	26	26	52	26
BE-1	Y	N	Teenage Recreational User	26	26	52	26
BE-2	Y	N	Teenage Recreational User	NE	NE	52	26
SC01	Y	N	Dredger	NE	NE	167	83
SC02	Y	N	Dredger	NE	NE	167	83
SC03	Y	N	Dredger	NE	NE	167	83
SC04	Y	N	Dredger	NE	NE	167	83
HB04	N	Y	Groundskeeper	30	15	100	50
SO	N	Y	Groundskeeper	30	15	100	50
HB04	N	Y	Teenage Recreational User	26	26	52	26
SO	N	Y	Day Care Child	150	150	150	150
HB04	N	Y	Construction Worker	NE	NE	125	40
SO	N	Y	Construction Worker	NE	NE	125	40
Class A (gw)	N	N	Construction Worker	NE	NE	125	40
Study Area (gw)	N	N	Construction Worker	NE	NE	125	40
Class A (gw/air)	N	N	Industrial Worker	NE	NE	250	219
Study Area (gw/air)	N	N	Industrial Worker	NE	NE	250	219
Class A (air)	N	N	Car Wash Worker	NE	NE	250	219
Study Area (air)	N	N	Car Wash Worker	NE	NE	250	219

Notes

NE = No exposure under current/future land use conditions.

gw = groundwater

**TABLE 7
COMPARISON OF GROUNDWATER ANALYTICAL RESULTS TO MCLs - AF SERIES WELLS
INDUSTRI-PLEX SUPERFUND SITE**

Parameter	Well: Screen Depth: Date:		AF01 16' - 26' 2/11/2002	AF01 74' 1/17/2002	AF01 115' 4/8/2002	AF02 5' - 15' 3/27/2002	AF02 32' 3/27/2002	AF02 75' 3/26/2002	AF03 10' - 19.5' 2/22/2002	AF03 37' 2/25/2002	AF03 49' 2/22/2002	AF03 61' 2/25/2002
	EPA MCL	Secondary MCL										
VOCs (ug/L)												
1,1-Dichloroethene			0.5 U	0.5 U	0.57 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone			5 U	5 U	5 U	100 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone			5 UJ	5 UJ	5 U	100 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ
Benzene	5		0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U	0.5 UJ
Chloroform			0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	70		0.5 U	0.5 U	0.31 J	10 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	700		0.5 UJ	0.48 J	0.5 U	10 U	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U	0.5 UJ
Methyl tert-Butyl Ether			0.5 U	0.62	0.18 J	4000 J	0.5 U	0.5 U	1.6	0.73 J	1.8	1.175 J
Tetrachloroethene	5		0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	1000		0.5 UJ	1.6	0.5 U	10 U	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U	0.5 UJ
Trichloroethene	5		0.5 U	0.5 U	3.5 J	10 U	0.46 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylene, total	10000		0.5 U	3.4	0.5 U	10 U	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U	0.5 UJ
SVOCs (ug/L)												
bis(2-Ethylhexyl)phthalate	6		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (ug/L)												
Aluminum		50-200	305	44 U	47.3 UJ	50.3 J	65.6 U	65.6 U	76.2 UJ	51.3 UJ	44 U	83.6 UJ
Antimony	6		1.5 U	1.5 U	9.9 U	4 U	4 U	4 U	1.5 U	1.5 U	1.5 U	1.5 U
Arsenic	10		27.9	1.7 U	2 U	2.4 U	5.4	2.4 U	1.7 U	1.7 U	1.7 U	1.7 U
Barium	2000		110	16	75.3	208.5	67.3	88.8	104	68.4	137	140
Beryllium	4		0.47 UJ	0.3 U	0.2 U	0.2 U	0.2 U	0.2 U	0.3 U	0.3 U	0.3 U	0.3 U
Cadmium	5		0.3 U	0.3 U	0.4 U	0.965	0.3 U	0.3 U	0.51 UJ	2.6 U	0.59 UJ	1.1 U
Calcium			132000	15700	64700	92400	115000	121000	68100	54900	125000	169500
Chromium	100		0.9 U	0.9 U	2.2 U	0.6 U	0.6 U	0.6 U	0.9 U	0.9 U	0.9 U	0.9 U
Cobalt			12.6	2 U	0.77 J	12.3	0.7 U	0.7 U	4	2 U	8.8	15.95
Copper	1300	1000	1.8 U	9.1 U	2.1 UJ	3.425 J	4.3 U	17.9	1.8 U	4.1 U	18.6	6 U
Iron		300	16600	10800	9730	230.5	10500	4590	2060 U	566 U	4840	597 U
Lead	15		1.6 U	1.6 U	1.1 U	1.8 U	1.8 U	1.8 U	1.6 U	2.4 UJ	1.6 U	1.6 U
Magnesium			14800	3490	13500	14550	27200	29400	12100	8180	26900	42850
Manganese		50	3070	272	824	616	776	377	1950	465	1650	1645
Mercury	2		0.1 U	0.12 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U
Nickel			4.4 U	1 U	2.3 U	15.2	3.9	2.1 J	3.2 U	3.7 U	4 U	2.8 U
Potassium			18200 J	2130 J	5310	11900	9870	11800	9560	7620	15300	14600
Selenium	50		1.9 U	1.9 U	2.1 U	4.6 U	4.6 U	4.6 U	1.9 U	1.9 U	1.9 U	1.9 U
Sodium			202000	9770	19000	176000 J	70900 J	77600 J	201000	168000	301000	334500
Thallium	2		3 UJ	3 U	2.2 U	6 U	6 U	6 U	3 UJ	3 UJ	3 UJ	3 UJ
Vanadium			1.7 U	1.7 U	0.77 UJ	0.8 U	0.8 U	0.8 U	1.7 U	1.7 U	1.7 U	1.7 U
Zinc		5000	21.1	66.3	8.6 U	71.65	62	102	4.6 U	28.8	79.6	71.65

Notes:

- All results in micrograms per liter (ug/l)
- N/A - Not Analyzed or Not Available
- U - Not detected above given laboratory reporting limit
- J - Estimated concentration

- Identifies detected concentrations in excess of MCLs.
- Identifies detected concentrations in excess of Secondary MCLs.

TABLE 8
SUMMARY OF P-1 TRANSECT GROUNDWATER ANALYTICAL RESULTS - FILTERED ONLY
INDUSTRI-PLEX SUPERFUND SITE

Parameter	Well:		P1-01								
	Screen Depth:		gw_depth = 01	gw_depth = 01	gw_depth = 02	gw_depth = 03	gw_depth = 03	gw_depth = 03	gw_depth = 04	gw_depth = 05	gw_depth = 06
	Date:		4/12/2001	7/27/2001	5/25/2001	4/26/2001	5/7/2001	7/20/2001	7/27/2001	8/1/2001	2/6/2002
	EPA MCL	Secondary MCL									
SVOCs (ug/L)											
None Detected											
Dissolved Metals (ug/L)											
Aluminum		50-200	168 UJ	32 U	32 U	NA	32 U	32 U	32 U	68.5 J	NA
Arsenic	10		6.4 J	28.9	2.87	0.989	3.7 U	0.922	0.247 U	2.24	0.2 U
Barium	2000		64.2 J	93.9 J	52.9 J	NA	9.1 J	56.8 J	13.3 J	28.55 J	NA
Beryllium	4		0.64 U	0.64 U	0.64 U	NA	0.64 U	0.64 U	0.64 U	0.64 U	NA
Cadmium	5		0.64 U	0.64 U	0.64 U	NA	0.64 U	0.64 U	0.76 J	0.64 U	NA
Calcium			73000	142000	157000	NA	24200	112000	42300	34800	NA
Chromium	100		1.9 J	1.7 U	4 J	NA	1.7 U	1.7 U	1.7 U	1.475 J	NA
Cobalt			1.8 U	12.4 J	2.7 UJ	NA	1.8 U	1.8 U	1.8 U	4.1 J	NA
Copper	1300	1000	2.4 U	2.4 U	2.4 U	NA	2.4 U	2.4 U	2.4 U	2.05 J	NA
Iron		300	12300	21500	1240	NA	38 U	837 J	771	24250	NA
Lead	15		8.8 U	8.8 U	8.8 U	NA	8.8 U	8.8 U	13.2 J	8.8 U	NA
Magnesium			8180	12800	12000	NA	3650	13400	7660	6125	NA
Manganese		50	414	2140	42.6	NA	415	42.8	12.7	247.5	NA
Mercury	2		0.03 U	0.04 UJ	0.03 U	NA	0.03 U	0.03 U	0.03 U	0.09 UJ	NA
Nickel			1.6 U	2 J	2.2 J	NA	7.4 J	1.6 U	1.6 U	1.6 UJ	NA
Potassium			7740	21300	12600	NA	3010	22600	2580	2720	NA
Sodium			87400	240000	306000	NA	56800	180000	48100	36850	NA
Vanadium			3.6 J	1.6 U	1.6 U	NA	1.6 U	1.6 U	1.6 U	1.6 U	NA
Zinc		5000	3.2 U	4.4 J	3.2 U	NA	3.2 U	3.2 U	3.2 U	3.2 J	NA

Notes:

All results in micrograms per liter (ug/l)

N/A - Not Analyzed or Not Available

U - Not detected above given laboratory reporting limit

J - Estimated concentration

 - Identifies detected concentrations in excess of MCLs.

 - Identifies detected concentrations in excess of Secondary MCLs.

TABLE 8
SUMMARY OF P-1 TRANSECT GROUNDWATER ANALYTICAL RESULTS - FILTERED ONLY
INDUSTRI-PLEX SUPERFUND SITE

Parameter	Well:		P1-01	P1-01	P1-02	P1-02	P1-02	P1-02	P1-02	P1-02	P1-03
	Screen Depth:		gw_depth = 07	gw_depth = 08	gw_depth = 01	gw_depth = 02	gw_depth = 03	gw_depth = 04	gw_depth = 05	gw_depth = 06	gw_depth = 01
	Date:		11/12/2001	2/8/2002	7/20/2001	5/25/2001	7/20/2001	7/30/2001	2/8/2002	2/6/2002	4/20/2001
	EPA MCL	Secondary MCL									
SVOCs (ug/L)											
None Detected											
Dissolved Metals (ug/L)											
Aluminum		50-200	32 U	NA	32 U	32 U	32 U	32 U	NA	NA	73.8 J
Arsenic	10		6.49	0.568	57	13.1	41.7	1.71	0.353 J	0.54	0.514 U
Barium	2000		26.3 J	NA	68.9 J	54.7 J	62 J	61.6 J	NA	NA	118
Beryllium	4		0.64 U	NA	0.64 U	0.64 U	0.64 U	0.64 U	NA	NA	0.64 U
Cadmium	5		0.64 U	NA	0.64 U	0.66 J	0.64 U	0.64 U	NA	NA	0.64 U
Calcium			30100	NA	106000	18800	14700	134500	NA	NA	41800
Chromium	100		1.7 U	NA	2 J	1.7 U	1.7 U	1.7 U	NA	NA	1.7 U
Cobalt			11.4 J	NA	1.8 U	1.8 U	2.4 J	1.8 U	NA	NA	4.5 J
Copper	1300	1000	3.6 J	NA	2.4 U	2.4 U	2.4 U	2.4 U	NA	NA	2.4 U
Iron		300	53.2 J	NA	26200 J	2640	4390 J	1920	NA	NA	1400
Lead	15		8.8 U	NA	8.8 U	8.8 U	8.8 U	8.8 U	NA	NA	8.8 U
Magnesium			5670	NA	16400	3450	2820	22500	NA	NA	4650
Manganese		50	1000	NA	6800	346	300	1755	NA	NA	289
Mercury	2		0.03 U	NA	0.03 U	0.03 U	0.03 U	0.03 U	NA	NA	0.03 J
Nickel			111 J	NA	3.3 J	5.3 J	1.7 J	1.6 UJ	NA	NA	1.6 U
Potassium			5220 J	NA	5970	2790	2770	5340	NA	NA	4990
Sodium			18000	NA	134000	68900	50100	28400	NA	NA	115000
Vanadium			1.6 U	NA	1.6 U	1.6 U	1.6 U	1.6 U	NA	NA	1.6 U
Zinc		5000	3000	NA	5 J	43.6	55.7	3.2 U	NA	NA	7.2 J

Notes:

All results in micrograms per liter (ug/l)

N/A - Not Analyzed or Not Available

U - Not detected above given laboratory reporting limit

J - Estimated concentration

 - Identifies detected concentrations in excess of MCLs.

 - Identifies detected concentrations in excess of Secondary MCLs.

TABLE 8
SUMMARY OF P-1 TRANSECT GROUNDWATER ANALYTICAL RESULTS - FILTERED ONLY
INDUSTRI-PLEX SUPERFUND SITE

Parameter	Well:		P1-03	P1-03	P1-03	P1-03	P1-04	P1-04	P1-04	P1-04	P1-05
	Screen Depth:		gw_depth = 02	gw_depth = 03	gw_depth = 04	gw_depth = 05	gw_depth = 01	gw_depth = 02	gw_depth = 03	gw_depth = 04	gw_depth = 01
	Date:		4/20/2001	4/26/2001	4/26/2001	5/16/2001	4/20/2001	4/20/2001	4/24/2001	4/24/2001	4/19/2001
	EPA MCL	Secondary MCL									
SVOCs (ug/L)											
None Detected											
Dissolved Metals (ug/L)											
Aluminum		50-200	32 U	449 U	61.4 UJ	32 U	107 J	115 J	32 U	32 U	150 J
Arsenic	10		0.48 U	19.5	2.6	1.11 U	1.2 U	0.686 U	0.342 J	0.82	1.18
Barium	2000		148	38.8 J	R	95.8 J	61 J	85.2 J	91.6 J	45.2 J	121
Beryllium	4		0.64 U	2.4 J	0.64 U						
Cadmium	5		0.64 U	2.4 J	0.64 U	0.79 J	0.64 U				
Calcium			69300	69500	127000	94300	17700	56400	40800	45900	51900
Chromium	100		1.7 U	3.3 J	1.7 U	1.7 U	1.7 U	3.15 J	1.7 U	1.7 U	1.7 U
Cobalt			9.6 J	1.8 U	1.8 U	1.8 U	3.6 J	1.8 U	1.8 U	1.8 U	1.8 U
Copper	1300	1000	2.4 U								
Iron		300	703	10200	3460	36000	3060	2695	883	713	5480
Lead	15		8.8 U								
Magnesium			9580	18500	30500	22800	1390	8885	5490	14200	3710
Manganese		50	272	219	428	1060	32.4	320.5	9.5 J	186	69.3
Mercury	2		0.03 U	0.26 U	0.03 U						
Nickel			1.6 U	3.9 J	1.6 U						
Potassium			8690	5710	7660	4950	776	4460	3890	3980	3410
Sodium			109000	46900	90500	47600	25000	67100	93200	75400	142000
Vanadium			1.6 U	3.5 J	1.6 U						
Zinc		5000	6.4 J	3.2 U	R	3.2 U	30.4	5 J	12.1 J	6.6 J	5.1 J

Notes:

All results in micrograms per liter (ug/l)

N/A - Not Analyzed or Not Available

U - Not detected above given laboratory reporting limit

J - Estimated concentration

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 - Identifies detected concentrations in excess of Secondary MCLs.

TABLE 8
SUMMARY OF P-1 TRANSECT GROUNDWATER ANALYTICAL RESULTS - FILTERED ONLY
INDUSTRI-PLEX SUPERFUND SITE

Parameter	Well:		P1-05	P1-05	P1-05	P1-05	P1-06	P1-06	P1-06	P1-06	P1-07
	Screen Depth:		gw_depth = 02	gw_depth = 03	gw_depth = 04	gw_depth = 05	gw_depth = 01	gw_depth = 02	gw_depth = 03	gw_depth = 04	gw_depth = 01
	Date:		4/19/2001	4/25/2001	4/26/2001	4/30/2001	4/13/2001	4/13/2001	4/13/2001	4/13/2001	4/18/2001
	EPA MCL	Secondary MCL									
SVOCs (ug/L)											
None Detected											
Dissolved Metals (ug/L)											
Aluminum		50-200	32 U	72.9 J	71.2 UJ	35.3 UJ	59.8 UJ	40.4 UJ	54.1 UJ	44.4 UJ	56.9 UJ
Arsenic	10		0.2 U	0.563	1.09	0.2 U	0.527 U	0.455 U	0.2 U	0.2 U	0.2 U
Barium	2000		58.8 J	80.1 J	92.5 J	93.5 J	363	29.6 J	45.6 J	40 J	87.4 J
Beryllium	4		0.64 U								
Cadmium	5		0.64 U	0.64 U	0.88 J	0.96 J	0.64 U				
Calcium			46900	45900	44500	74200	52600	30200	17500	59600	22600
Chromium	100		1.7 U								
Cobalt			3.9 J	1.8 U	1.8 U	4.4 J	1.8 U	1.8 U	1.8 U	3.1 J	1.8 U
Copper	1300	1000	2.7 J	2.4 U							
Iron		300	7330	12900	9740	1860	504	203	248	286	582
Lead	15		8.8 U								
Magnesium			6490	7050	11400	28900	7960	8530	3650	12900	7230
Manganese		50	295	237	220	382	16.9	25.1	480	128	67.55
Mercury	2		0.03 U								
Nickel			1.6 U	1.6 U	2 J	1.6 U	1.6 U	1.6 U	10.6 J	43.5 J	1.6 U
Potassium			4400	3770	5280	8430	10700	1730	2680	4370	3685
Sodium			53700	70000	90000	119000	912000	35600	42700	144000	126000
Vanadium			1.6 U								
Zinc		5000	9.4 J	7.9 J	28.5	8.7 J	6.3 J	6.6 J	7.6 J	7.5 J	3.2 U

Notes:

All results in micrograms per liter (ug/l)

N/A - Not Analyzed or Not Available

U - Not detected above given laboratory reporting limit

J - Estimated concentration

 - Identifies detected concentrations in excess of MCLs.

 - Identifies detected concentrations in excess of Secondary MCLs.

TABLE 8
SUMMARY OF P-1 TRANSECT GROUNDWATER ANALYTICAL RESULTS - FILTERED ONLY
INDUSTRI-PLEX SUPERFUND SITE

Parameter	Well:		P1-07	P1-07	P1-07
	Screen Depth:		gw_depth = 02	gw_depth = 03	gw_depth = 03
	Date:		4/30/2001	4/30/2001	5/7/2001
	EPA MCL	Secondary MCL			
SVOCs (ug/L)					
None Detected					
<u>Dissolved Metals (ug/L)</u>					
Aluminum		50-200	35.7 UJ	NA	32 U
Arsenic	10		0.2 U	3.32	3.7 U
Barium	2000		32.2 J	NA	34 J
Beryllium	4		0.64 U	NA	0.64 U
Cadmium	5		0.94 J	NA	0.64 U
Calcium			71500	NA	84000
Chromium	100		1.8 J	NA	1.7 U
Cobalt			5.3 J	NA	12 J
Copper	1300	1000	2.4 U	NA	2.4 U
Iron		300	38 U	NA	777
Lead	15		8.8 U	NA	8.8 U
Magnesium			18200	NA	20500
Manganese		50	479	NA	1740
Mercury	2		0.03 U	NA	0.03 U
Nickel			1.6 U	NA	18.9 J
Potassium			6790	NA	6670
Sodium			173000	NA	162000
Vanadium			1.6 U	NA	1.6 U
Zinc		5000	5.6 J	NA	3.2 U

Notes:

All results in micrograms per liter (ug/l)

N/A - Not Analyzed or Not Available

U - Not detected above given laboratory reporting limit

J - Estimated concentration

 - Identifies detected concentrations in excess of MCLs.

 - Identifies detected concentrations in excess of Secondary MCLs.

TABLE 9
SUMMARY OF RECEPTOR RISKS
HUMAN HEALTH RISK ASSESSMENT
INDUSTRI-PLEX SUPERFUND SITE

Station	Scenario/Receptor	RME or CT	Total Cancer Risks	Total Noncancer Risks	Media > 1E-04 or HI > 1	Major contributors to risk (> 1E-06, HI > 1)
HB01/A6	Current Rec. User (baseflow; wader)	RME CT	1E-05 2E-06	3E-01 2E-01		N/A
	Future Rec. User (surface soil) (baseflow; wader)	RME CT	2E-05 2E-06	6E-01 2E-01		N/A
	Future Rec. User (subsurface soil) (baseflow; wader)	RME CT	2E-05 1E-06	7E-01 1E-01		N/A
	Future Rec. User (surface soil) (storm event; wader)	RME CT	2E-05 2E-06	6E-01 2E-01		N/A
	Future Rec. User (subsurface soil) (storm event; wader)	RME CT	2E-05 1E-06	7E-01 1E-01		N/A
	HB02/HB04	Future Rec. User (baseflow; wader)	RME CT	1E-05 2E-06	4E-01 2E-01	
Future Rec. User (storm event; wader)		RME CT	1E-05 2E-06	4E-01 1E-01		N/A
HB03	Current Rec. User (baseflow; wader)	RME CT	3E-06 7E-07	9E-02 6E-02		N/A
	Future Rec. User (baseflow; wader)	RME CT	6E-06 7E-07	2E-01 6E-02		N/A
	Future Rec. User (storm event; wader)	RME CT	6E-06 7E-07	2E-01 6E-02		N/A
AR	Current Rec. User (baseflow; wader)	RME CT	5E-06 1E-06	2E-01 1E-01		N/A
	Future Rec. User (baseflow; wader)	RME CT	1E-05 1E-06	3E-01 1E-01		N/A
	Future Rec. User (storm event; wader)	RME CT	1E-05 1E-06	3E-01 1E-01		N/A
BE-1	Current Rec. User	RME CT	2E-07 5E-08	8E-03 4E-03		N/A
	Future Rec. User	RME CT	1E-06 1E-07	4E-02 1E-02		N/A
BE-2	Future Rec. User (baseflow; wader)	RME CT	6E-06 8E-07	2E-01 6E-02		N/A
	Future Rec. User (storm event; wader)	RME CT	6E-06 8E-07	2E-01 6E-02		N/A
SC01	Future Dredger	RME CT	5E-06 4E-07	4E-01 7E-02		N/A
SC02	Future Dredger	RME CT	5E-05 6E-06	4E+00 1E+00	sediment	(NC) - As
SC03	Future Dredger	RME CT	2E-06 2E-07	1E-01 3E-02		N/A

TABLE 9
SUMMARY OF RECEPTOR RISKS
HUMAN HEALTH RISK ASSESSMENT
INDUSTRI-PLEX SUPERFUND SITE

Station	Scenario/Receptor	RME or CT	Total Cancer Risks	Total Noncancer Risks	Media > 1E-04 or HI > 1	Major contributors to risk (> 1E-06, HI > 1)
SC04	Future Dredger	RME CT	5E-06 5E-07	4E-01 9E-02		N/A
HBHA	Current Rec. User (fishing)	RME CT	2E-05 2E-06	6E-01 2E-01		N/A
	Future Rec. User (fishing)	RME CT	2E-05 2E-06	6E-01 2E-01		N/A
HB04	Current Rec. User	RME CT	3E-07 7E-08	1E-02 6E-03		N/A
	Current Groundskeeper (surface soil)	RME CT	2E-06 4E-07	1E-02 7E-03		N/A
	Future Groundskeeper (surface soil)	RME CT	7E-06 1E-06	5E-02 2E-02		N/A
	Future Day Care Child (surface soil)	RME CT	2E-05 4E-06	6E-01 3E-01		N/A
	Future Const. Worker (surface soil)	RME CT	6E-07 2E-07	1E-01 3E-02		N/A
SO	Current Groundskeeper (surface soil)	RME CT	1E-05 2E-06	5E-02 2E-02		N/A
	Current Day Care Child (surface soil)	RME CT	1E-04 1E-05	1E+00 7E-01		N/A
	Future Groundskeeper (surface soil)	RME CT	4E-05 6E-06	2E-01 8E-02		N/A
	Future Day Care Child (surface soil)	RME CT	1E-04 2E-05	2E+00 1E+00	soil	(C) - As
	Future Day Care Child (subsurface soil)	RME CT	1E-03 3E-04	4E+01 2E+01	soil	(C) - As (NC) - As
	Future Const. Worker (surface soil)	RME CT	3E-06 1E-06	4E-01 1E-01		N/A
	Future Const. Worker (subsurface soil)	RME CT	4E-05 1E-05	7E+00 2E+00	soil	(NC) - As N/A

TABLE 9
SUMMARY OF RECEPTOR RISKS
HUMAN HEALTH RISK ASSESSMENT
INDUSTRI-PLEX SUPERFUND SITE

Station	Scenario/Receptor	RME or CT	Total Cancer Risks	Total Noncancer Risks	Media > 1E-04 or HI > 1	Major contributors to risk (> 1E-06, HI > 1)
Class A	Future Const. Worker (groundwater only)	RME CT	4E-07 2E-08	1E-01 1E-02		N/A
	Future Industrial Worker	RME CT	1E-05 3E-06	2E-01 1E-01		N/A
	Future Car Wash Worker	RME CT	N/A N/A	2E-02 1E-02		N/A
Study Area	Future Const. Worker	RME CT	2E-05 7E-06	3E+00 1E+00	groundwater	(NC) - As
	Future Industrial Worker	RME CT	5E-03 1E-03	6E+01 5E+01	groundwater indoor air	(C) - 1,2-Dichloroethane, benzene, chloroform, trichloroethene, pentachlorophenol, MTBE, As (NC) - Benzene, naphthalene, As
	Future Car Wash Worker	RME CT	6E-03 2E-03	8E+01 7E+01	indoor air	(C) - 1,2-Dichloroethane, benzene, chloroform, trichloroethene, MTBE (NC) - Benzene, naphthalene

Notes

Bolded values exceed a cancer risk of 1E-04 or a target organ HI of 1.

HI - Hazard Index
RME - Reasonable Maximum Exposure
CT - Central Tendency Exposure
As - Arsenic
MTBE - Methyl tert-butyl ether

(C) - Carcinogenic Risk
(NC) - Noncarcinogenic Risk
NE - Not Evaluated
N/A - Not Applicable

APPENDIX 6C

HUMAN HEALTH REFERENCE CALCULATIONS

Surface Water, Sediment and Fish Fillet Tissue

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/ Future ^a	Surface Water	Surface Water	River/Stream (Stations 23 & 27, SW-MC-04, SW-MC-12, and SW-MC-01)	1-Day Recreational User	Adult	Dermal	Ref	Quant	Residents may contact surface water during recreational activities (wading) with low frequency in partially isolated areas.
						Ingestion	Ref	None	Since surface waters are shallow, wading but not swimming is expected, and ingestion is unlikely.
				Young Child	Dermal	Ref	Quant	Residents may contact surface water during recreational activities (wading) with low frequency in partially isolated areas.	
					Ingestion	Ref	None	Since surface waters are shallow, wading but not swimming is expected, and ingestion is unlikely.	
			River/Stream (Stations 23 & 27, SW-MC-04, SW-MC-12, and SW-MC-01)	4-Day Recreational User	Adult	Dermal	Ref	Quant	Residents may contact surface water during recreational activities (wading) with high frequency in residential areas.
						Ingestion	Ref	None	Since surface waters are shallow, wading but not swimming is expected, and ingestion is unlikely.
				Young Child	Dermal	Ref	Quant	Residents may contact surface water during recreational activities (wading) with high frequency in residential areas.	
					Ingestion	Ref	None	Since surface waters are shallow, wading but not swimming is expected, and ingestion is unlikely.	
			Wetland (Station 24)	1-Day Recreational User	Adult	Dermal	Ref	Quant	Residents may contact surface water during recreational activities (wading) with low frequency in partially isolated areas.
						Ingestion	Ref	None	Since surface waters are shallow, wading but not swimming is expected, and ingestion is unlikely.
				Young Child	Dermal	Ref	Quant	Residents may contact surface water during recreational activities (wading) with low frequency in partially isolated areas.	
					Ingestion	Ref	None	Since surface waters are shallow, wading but not swimming is expected, and ingestion is unlikely.	
Wetland (Station 24)	4-Day Recreational User	Adult	Dermal	Ref	Quant	Residents may contact surface water during recreational activities (wading) with high frequency in residential areas.			
			Ingestion	Ref	None	Since surface waters are shallow, wading but not swimming is expected, and ingestion is unlikely.			
	Young Child	Dermal	Ref	Quant	Residents may contact surface water during recreational activities (wading) with high frequency in residential areas.				
	Ingestion	Ref	None	Since surface waters are shallow, wading but not swimming is expected, and ingestion is unlikely.					

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
			Pond/Lake (Stations 25 & 26, SW-MC-02, and SW-MC-03)	1-Day Recreational User	Adult	Dermal	Ref	Quant	Residents may contact surface water during recreational activities (wading) with low frequency in partially isolated areas.
						Ingestion	Ref	None	Since surface waters are shallow, wading but not swimming is expected, and ingestion is unlikely.
				Young Child	Dermal	Ref	Quant	Residents may contact surface water during recreational activities (wading) with low frequency in partially isolated areas.	
					Ingestion	Ref	None	Since surface waters are shallow, wading but not swimming is expected, and ingestion is unlikely.	
			Pond/Lake (Stations 25 & 26, SW-MC-02, and SW-MC-03)	4-Day Recreational User	Adult	Dermal	Ref	Quant	Residents may contact surface water during recreational activities (wading) with high frequency in residential areas.
						Ingestion	Ref	None	Since surface waters are shallow, wading but not swimming is expected, and ingestion is unlikely.
				Young Child	Dermal	Ref	Quant	Residents may contact surface water during recreational activities (wading) with high frequency in residential areas.	
					Ingestion	Ref	None	Since surface waters are shallow, wading but not swimming is expected, and ingestion is unlikely.	
			Pond/Lake (Stations 25 & 26, SW-MC-02, and SW-MC-03)	Recreational User	Adult	Dermal	Ref	Quant	Due to surface water depth, residents may use these areas for swimming.
							Ingestion	Ref	Quant
					Young Child	Dermal	Ref	Quant	Due to surface water depth, residents may use these areas for swimming.
							Ingestion	Ref	Quant
Current/ Future ^a	Surface Water	Fish Tissue	Fish from reference areas	Recreational User	Adult	Dermal	Ref	None	Exposure to contaminants in fish unlikely through dermal pathway.
							Ingestion	Ref	Quant
					Older Child	Dermal	Ref	None	Exposure to contaminants in fish unlikely through the dermal pathway.
						Ingestion	Ref	Quant	Possibility of contaminants in fish exposed to surface water.

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/ Future ^a	Sediment	Sediment	River/Stream (Stations 23 & 27, SD-MC-04, SD-MC-12, and SD-MC-01)	1-Day Recreational User	Adult	Dermal	Ref	Quant	Residents may contact sediments during recreational activities (wading) with low frequency in partially isolated areas.
						Ingestion	Ref	Quant	Residents may contact sediments during recreational activities (wading) with low frequency in partially isolated areas.
					Young Child	Dermal	Ref	Quant	Residents may contact sediments during recreational activities (wading) with low frequency in partially isolated areas.
						Ingestion	Ref	Quant	Residents may contact sediments during recreational activities (wading) with low frequency in partially isolated areas.
			River/Stream (Stations 23 & 27, SD-MC-04, SD-MC-12, and SD-MC-01)	4-Day Recreational User	Adult	Dermal	Ref	Quant	Residents may contact sediments during recreational activities (wading) with high frequency in residential areas.
						Ingestion	Ref	Quant	Residents may contact sediments during recreational activities (wading) with high frequency in residential areas.
					Young Child	Dermal	Ref	Quant	Residents may contact sediments during recreational activities (wading) with high frequency in residential areas.
						Ingestion	Ref	Quant	Residents may contact sediments during recreational activities (wading) with high frequency in residential areas.
			Wetland (Stations 24, HB, and SA)	1-Day Recreational User	Adult	Dermal	Ref	Quant	Residents may contact sediments during recreational activities (wading) with low frequency in partially isolated areas.
						Ingestion	Ref	Quant	Residents may contact sediments during recreational activities (wading) with low frequency in partially isolated areas.
					Young Child	Dermal	Ref	Quant	Residents may contact sediments during recreational activities (wading) with low frequency in partially isolated areas.
						Ingestion	Ref	Quant	Residents may contact sediments during recreational activities (wading) with low frequency in partially isolated areas.
Wetland (Stations 24, HB, and SA)	4-Day Recreational User	Adult	Dermal	Ref	Quant	Residents may contact sediments during recreational activities (wading) with high frequency in residential areas.			
			Ingestion	Ref	Quant	Residents may contact sediments during recreational activities (wading) with high frequency in residential areas.			
		Young Child	Dermal	Ref	Quant	Residents may contact sediments during recreational activities (wading) with high frequency in residential areas.			
			Ingestion	Ref	Quant	Residents may contact sediments during recreational activities (wading) with high frequency in residential areas.			

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
			Pond/Lake (Station SD-MC-02)	1-Day Recreational User	Adult	Dermal	Ref	Quant	Residents may contact sediments during recreational activities (wading and swimming) with low frequency in partially isolated areas.
						Ingestion	Ref	Quant	Residents may contact sediments during recreational activities (wading and swimming) with low frequency in partially isolated areas.
				Young Child	Dermal	Ref	Quant	Residents may contact sediments during recreational activities (wading and swimming) with low frequency in partially isolated areas.	
					Ingestion	Ref	Quant	Residents may contact sediments during recreational activities (wading and swimming) with low frequency in partially isolated areas.	
			Pond/Lake (Station SD-MC-02)	4-Day Recreational User	Adult	Dermal	Ref	Quant	Residents may contact sediments during recreational activities (wading and swimming) with high frequency in residential areas.
						Ingestion	Ref	Quant	Residents may contact sediments during recreational activities (wading and swimming) with high frequency in residential areas.
	Young Child	Dermal	Ref	Quant	Residents may contact sediments during recreational activities (wading and swimming) with high frequency in residential areas.				
		Ingestion	Ref	Quant	Residents may contact sediments during recreational activities (wading and swimming) with high frequency in residential areas.				

^a The range of exposure assumptions used are intended to be protective of current as well as future worst-case land use scenarios.

Ref = Reference area

TABLE 2.1
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
 INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Combined Reference Data^a

CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Minimum Qualifier	Maximum Concentration ⁽¹⁾	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value ⁽²⁾	Screening Toxicity Value ⁽³⁾	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁴⁾
117-81-7	bis(2-Ethylhexyl)phthalate	3.0	J	3.0	J	ug/L	SW-MC-03-01	1 / 11	4 - 5	3	N/A	4.8 C	1.8	AWQC	YES	ASL
5103-74-2	gamma-Chlordane	0.0017	J	0.0017	J	ug/L	SW-24-01	1 / 11	0.0083 - 0.05	0.0017	N/A	0.19 C	0.0021	AWQC	NO	BSL
7429-90-5	Aluminum	21.3		2500		ug/L	SW-MC-01	9 / 11	23.5 - 29.2	2500	N/A	N/A	N/A	N/A	NO	NTX
7440-38-2	Arsenic	1.1	J	15.7	J	ug/L	SW-MC-01	8 / 11	1 - 1.7	15.7	N/A	0.045 C	0.018	AWQC	YES	ASL
7440-39-3	Barium	15.4		64		ug/L	SW-MC-01	11 / 11	N/A	64	N/A	260 N	N/A	N/A	NO	BSL
7440-70-2	Calcium	17700		37000		ug/L	SW-24-01	11 / 11	N/A	37000	N/A	N/A	N/A	N/A	NO	NUT
7440-47-3	Chromium	0.34		9	J	ug/L	SW-MC-03-01	4 / 11	0.25 - 9	9	N/A	11 N	N/A	N/A	NO	BSL
7440-48-4	Cobalt	3	J	7.1	J	ug/L	SW-MC-01	2 / 11	0.5 - 3	7.1	N/A	N/A	N/A	N/A	NO	NTX
7440-50-8	Copper	0.45		13.8		ug/L	SW-MC-01	8 / 11	0.35 - 1.4	13.8	N/A	150 N	1300	AWQC	NO	BSL
7439-89-6	Iron	118		15800		ug/L	SW-MC-01	11 / 11	N/A	15800	N/A	N/A	N/A	N/A	NO	NUT
7439-92-1	Lead	0.665	J	51.4		ug/L	SW-MC-01	8 / 11	0.75	51.4	N/A	15 N	N/A	N/A	YES	ASL
7439-95-4	Magnesium	2050		5950		ug/L	SW-24-01	11 / 11	N/A	5950	N/A	N/A	N/A	N/A	NO	NUT
7439-96-5	Manganese	46.4		1960		ug/L	SW-MC-01	11 / 11	N/A	1960	N/A	88 N	N/A	N/A	YES	ASL
7439-97-6	Mercury	0.097		0.13		ug/L	SW-24-01	4 / 11	0.04 - 0.087	0.13	N/A	1.1 N	0.05	AWQC	YES	ASL
7440-02-0	Nickel	0.66		6.5	J	ug/L	SW-MC-01	9 / 11	0.5 - 1.2	6.5	N/A	73 N	610	AWQC	NO	BSL
7440-09-7	Potassium	1080		6260		ug/L	SW-24-01	5 / 5	N/A	6260	N/A	N/A	N/A	N/A	NO	NUT
7782-49-2	Selenium	1.6	J	1.6	J	ug/L	SW-MC-04	1 / 11	1.1 - 1.9	1.6	N/A	18 N	170	AWQC	NO	BSL
7440-23-5	Sodium	42200		88300		ug/L	SW-26-01	5 / 5	N/A	88300	N/A	N/A	N/A	N/A	NO	NUT
7440-62-2	Vanadium	0.85		12	J	ug/L	SW-MC-01	6 / 11	0.55 - 2.6	12	N/A	26 N	N/A	N/A	NO	BSL
7440-66-6	Zinc	1.375	J	71.7		ug/L	SW-MC-01	7 / 11	1.6 - 9	71.7	N/A	1100 N	9100	AWQC	NO	BSL

^a Data presented are from surface water samples SW-23-01, SW-24-01, SW-25-01, SW-26-01, SW-27-01, SW-MC-01, SW-MC-02, SW-MC-03, SW-MC-03-01, SW-MC-04, and SW-MC-12.

- (1) Minimum/maximum detected concentration.
 (2) Refer to supporting information for background discussion.
 (3) USEPA Region 9 PRGs for tap water (adjusted to an hazard quotient = 0.1 for noncarcinogens), October 1, 2002.
 Lead value is a drinking water criterion protective of blood lead levels in children (USEPA, 2002e).
 PRG for chromium VI has been used for chromium.
 PRG for chlordane used for gamma-chlordane and alpha-chlordane.
 PRG for mercury chloride used for mercury.

Definitions:
 COPC = Chemical of Potential Concern
 ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
 PRG = Preliminary Remedial Goal
 N/A = Not Applicable or Not Available
 J = Estimated Value
 C = Carcinogenic
 N = Non-Carcinogenic
 AWQC = Ambient Water Quality Criterion for Human Health (1998b)

- (4) Rationale Codes Selection Reason: Above Screening Levels (ASL)
 Deletion Reason: No Toxicity Information (NTX)
 Essential Nutrient (NUT)
 Below Screening Level (BSL)

TABLE 2.2
COPCs DETECTED IN SURFACE WATER IN RIVER/STREAM REFERENCE SAMPLES
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Reference River/Stream ^a

CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Minimum Qualifier	Maximum Concentration ⁽¹⁾	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits
117-81-7	bis(2-Ethylhexyl)phthalate	ND		ND		ug/L	ND	0 / 5	4 - 5
7440-38-2	Arsenic	1.1	J	16	J	ug/L	SW-MC-01	4 / 5	2
7439-92-1	Lead ⁽²⁾	4.0	J	51		ug/L	SW-MC-01	3 / 5	1
7439-96-5	Manganese	48		1960		ug/L	SW-MC-01	5 / 5	N/A
7439-97-6	Mercury	0.097		0.11		ug/L	SW-23-01	2 / 5	0.04 - 0.087

^a Data presented are from surface water samples SW-MC-01, SW-MC-04, SW-MC-12, SW-23-01 and SW-27-01; only COPCs selected on Table 2.1 appear.

(1) Minimum/maximum detected concentration.

(2) Since lead cannot be quantitatively evaluated, it has been retained on this table for comparative purposes.

Definitions: COPC = Chemical of Potential Concern

N/A = Not Applicable or Not Available

J = Estimated Value

TABLE 2.3
COPCs DETECTED IN SURFACE WATER IN WETLAND REFERENCE SAMPLES
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Reference Wetland ^a

CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Minimum Qualifier	Maximum Concentration ⁽¹⁾	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits
117-81-7	bis(2-Ethylhexyl)phthalate	ND		ND		ug/L	ND	0 / 1	5
7440-38-2	Arsenic	3.2		3.2		ug/L	SW-24-01	1 / 1	N/A
7439-92-1	Lead ⁽²⁾	6.3		6.3		ug/L	SW-24-01	1 / 1	N/A
7439-96-5	Manganese	520		520		ug/L	SW-24-01	1 / 1	N/A
7439-97-6	Mercury	0.13		0.13		ug/L	SW-24-01	1 / 1	N/A

^a Data presented are from surface water sample SW-24-01; only COPCs selected on Table 2.1 appear.

(1) Minimum/maximum detected concentration.

(2) Since lead cannot be quantitatively evaluated, it has been retained on this table for comparative purposes.

Definitions: COPC = Chemical of Potential Concern

N/A = Not Applicable or Not Available

J = Estimated Value

TABLE 2.4
COPCs DETECTED IN SURFACE WATER IN LAKE REFERENCE SAMPLES
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Reference Pond/Lake ^a

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits
117-81-7	bis(2-Ethylhexyl)phthalate	3	J	3	J	ug/L	SW-MC-03-01	1 / 5	4 - 5
7440-38-2	Arsenic	1.2	J	2.9	J	ug/L	SW-MC-03-01	3 / 5	1 - 1.4
7439-92-1	Lead ⁽²⁾	0.67	J	3.2	J	ug/L	SW-MC-03	4 / 5	1
7439-96-5	Manganese	46		425		ug/L	SW-MC-03-01	5 / 5	N/A
7439-97-6	Mercury	0.12		0.12		ug/L	SW-25-01	1 / 5	0.04 - 0.08

^a Data presented are from surface water samples SW-MC-02, SW-MC-03, SW-MC-03-01, SW-25-01 and SW-26-01; only COPCs selected on Table 2.1 appear.

(1) Minimum/maximum detected concentration.

(2) Since lead cannot be quantitatively evaluated, it has been retained on this table for comparative purposes.

Definitions: COPC = Chemical of Potential Concern

N/A = Not Applicable or Not Available

J = Estimated Value

TABLE 2.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Combined Reference Data ^a

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
78-93-3	2-Butanone	0.23		0.68		mg/Kg	SD-MC-02	2 / 14	0.01 - 0.046	0.68	N/A	730 N	N/A	N/A	NO	BSL
67-64-1	Acetone	0.057	J	2.2	J	mg/Kg	SD-MC-02	4 / 15	0.01 - 0.22	2.2	N/A	160 N	N/A	N/A	NO	BSL
75-15-0	Carbon Disulfide	0.003	J	0.003	J	mg/Kg	SD-27-03-FW	1 / 14	0.01 - 0.046	0.003	N/A	36 N	N/A	N/A	NO	BSL
79-20-9	Methyl Acetate	0.0240		0.2100		mg/Kg	SD-MC-01-TR	4 / 4	0.01 - 0.055	0.2100	N/A	2200 N	N/A	N/A	NO	BSL
108-88-3	Toluene	0.0079	J	0.01	J	mg/Kg	SD-SA-01-TR	2 / 15	0.01 - 0.055	0.01	N/A	52 N	N/A	N/A	NO	BSL
91-57-6	2-Methylnaphthalene	0.023	J	0.36	J	mg/Kg	SD-24-02-FW	4 / 16	0.067 - 1	0.36	N/A	5.6 N	N/A	N/A	NO	BSL
106-44-5	4-Methylphenol	0.190	J	0.19	J	mg/Kg	SD-MC-01	1 / 11	0.32 - 2.1	0.19	N/A	31 N	N/A	N/A	NO	BSL
83-32-9	Acenaphthene	0.05	J	1.4	J	mg/Kg	SD-24-02-FW	5 / 16	0.067 - 1	1.4	N/A	370 N	N/A	N/A	NO	BSL
208-96-8	Acenaphthylene	0.044	J	0.8	J	mg/Kg	SD-24-02-FW	8 / 16	0.067 - 1	0.8	N/A	5.6 N	N/A	N/A	NO	BSL
120-12-7	Anthracene	0.048	J	1.9	J	mg/Kg	SD-24-02-FW	9 / 16	0.067 - 1	1.9	N/A	2200 N	N/A	N/A	NO	BSL
56-55-3	Benzo(a)anthracene	0.11	J	5.9	J	mg/Kg	SD-24-02-FW	12 / 16	0.067 - 1	5.9	N/A	0.62 C	N/A	N/A	YES	ASL
50-32-8	Benzo(a)pyrene	0.13	J	5.5	J	mg/Kg	SD-24-02-FW	12 / 16	0.067 - 1	5.5	N/A	0.062 C	N/A	N/A	YES	ASL
205-99-2	Benzo(b)fluoranthene	0.18	J	10	J	mg/Kg	SD-24-02-FW	13 / 16	0.067 - 1	10	N/A	0.62 C	N/A	N/A	YES	ASL
191-24-2	Benzo(g,h,i)perylene	0.21	J	1.4	J	mg/Kg	SD-MC-04	6 / 16	0.067 - 1	1.4	N/A	5.6 N	N/A	N/A	NO	BSL
207-08-9	Benzo(k)fluoranthene	0.4	J	9.6	J	mg/Kg	SD-24-02-FW	10 / 16	0.067 - 1	9.6	N/A	6.2 C	N/A	N/A	YES	ASL
117-81-7	bis(2-Ethylhexyl)phthalate	0.094	J	0.43	J	mg/Kg	SD-24-03-FW	6 / 15	0.23 - 2.1	0.43	N/A	35 C	N/A	N/A	NO	BSL
85-68-7	Butylbenzylphthalate	0.047	J	0.087	J	mg/Kg	SD-24-03-FW	2 / 15	0.23 - 2.1	0.087	N/A	1200 N	N/A	N/A	NO	BSL
86-74-8	Carbazole	0.048	J	0.99	J	mg/Kg	SD-24-02-FW	5 / 15	0.23 - 1	0.99	N/A	24 C	N/A	N/A	NO	BSL
218-01-9	Chrysene	0.14	J	7.3	J	mg/Kg	SD-24-02-FW	12 / 16	0.067 - 1	7.3	N/A	62 C	N/A	N/A	NO	BSL
53-70-3	Dibenz(a,h)anthracene	0.11	J	0.5	J	mg/Kg	SD-24-02-FW	6 / 16	0.067 - 1	0.5	N/A	0.062 C	N/A	N/A	YES	ASL
132-64-9	Dibenzofuran	0.12	J	1	J	mg/Kg	SD-24-02-FW	3 / 15	0.23 - 1	1	N/A	29 N	N/A	N/A	NO	BSL
84-66-2	Diethylphthalate	0.048	J	0.23	J	mg/Kg	SD-24-02-FW	3 / 16	0.23 - 1	0.23	N/A	4900 N	N/A	N/A	NO	BSL
84-74-2	Di-n-butylphthalate	0.16	J	0.16	J	mg/Kg	SD-27-02-FW	1 / 15	0.23 - 2.1	0.16	N/A	610 N	N/A	N/A	NO	BSL
206-44-0	Fluoranthene	0.071	J	15	J	mg/Kg	SD-24-02-FW	14 / 16	0.067 - 1	15	N/A	230 N	N/A	N/A	NO	BSL
86-73-7	Fluorene	0.044	J	2.8	J	mg/Kg	SD-24-02-FW	8 / 16	0.067 - 1	2.8	N/A	270 N	N/A	N/A	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.16	J	1.8	J	mg/Kg	SD-MC-04	8 / 16	0.067 - 1	1.8	N/A	0.62 C	N/A	N/A	YES	ASL
91-20-3	Naphthalene	0.023	J	0.52	J	mg/Kg	SD-24-02-FW	4 / 12	0.067 - 1	0.52	N/A	5.6 N	N/A	N/A	NO	BSL
85-01-8	Phenanthrene	0.17	J	12	J	mg/Kg	SD-24-02-FW	12 / 16	0.067 - 1	12	N/A	5.6 N	N/A	N/A	YES	ASL
129-00-0	Pyrene	0.081	J	11	J	mg/Kg	SD-24-02-FW	13 / 16	0.067 - 1	11	N/A	230 N	N/A	N/A	NO	BSL

TABLE 2.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Combined Reference Data ^a

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
72-54-8	4,4'-DDD	0.0045		0.39		mg/Kg	SD-24-03-ME	13 / 16	0.0019 - 0.021	0.39	N/A	2.4 C	N/A	N/A	NO	BSL
72-55-9	4,4'-DDE	0.0035	J	0.47	J	mg/Kg	SD-MC-01	12 / 16	0.00079 - 0.0036	0.47	N/A	1.7 C	N/A	N/A	NO	BSL
50-29-3	4,4'-DDT	0.0022		0.18	J	mg/Kg	SD-MC-01	10 / 16	0.00079 - 0.006	0.18	N/A	1.7 C	N/A	N/A	NO	BSL
309-00-2	Aldrin	0.00029	J	0.0016	J	mg/Kg	SD-24-02-FW	3 / 16	0.00076 - 0.011	0.0016	N/A	0.029 C	N/A	N/A	NO	BSL
319-84-6	alpha-BHC	0.00031	J	0.00031	J	mg/Kg	SD-24-02-FW	1 / 16	0.00076 - 0.011	0.00031	N/A	0.09 C	N/A	N/A	NO	BSL
5103-71-9	alpha-Chlordane	0.002	J	0.023	J	mg/Kg	SD-MC-01	3 / 16	0.00079 - 0.011	0.023	N/A	1.6 C	N/A	N/A	NO	BSL
12672-29-6	Aroclor 1248	0.29	J	0.29	J	mg/Kg	SD-24-03-ME	1 / 16	0.003 - 0.22	0.29	N/A	0.22 C	N/A	N/A	YES	ASL
11096-82-5	Aroclor 1260	0.2		0.2		mg/Kg	SD-24-03-ME	1 / 16	0.003 - 0.22	0.2	N/A	0.22 C	N/A	N/A	NO	BSL
319-85-7	beta-BHC	0.0004	J	0.00075	J	mg/Kg	SD-23-01-FW	2 / 16	0.00076 - 0.011	0.00075	N/A	0.32 C	N/A	N/A	NO	BSL
60-57-1	Dieldrin	0.0011	J	0.018		mg/Kg	SD-24-02-FW	5 / 16	0.00076 - 0.0046	0.018	N/A	0.03 C	N/A	N/A	NO	BSL
959-98-8	Endosulfan I	0.00022	J	0.035	J	mg/Kg	SD-27-02-FW	3 / 16	0.00076 - 0.0031	0.035	N/A	37 N	N/A	N/A	NO	BSL
33213-65-9	Endosulfan II	0.0023	J	0.0071		mg/Kg	SD-24-02-FW	3 / 16	0.00076 - 0.022	0.0071	N/A	37 N	N/A	N/A	NO	BSL
1031-07-8	Endosulfan Sulfate	0.0066		0.0091	J	mg/Kg	SD-27-02-FW	2 / 16	0.00076 - 0.022	0.0091	N/A	37 N	N/A	N/A	NO	BSL
72-20-8	Endrin	0.0003	J	0.0051		mg/Kg	SD-24-02-FW	3 / 16	0.00076 - 0.022	0.0051	N/A	1.8 N	N/A	N/A	NO	BSL
7421-36-3	Endrin Aldehyde	0.0011	J	0.0059	J	mg/Kg	SD-24-03-ME	2 / 12	0.0019 - 0.022	0.0059	N/A	1.8 N	N/A	N/A	NO	BSL
53494-70-5	Endrin Ketone	0.0027	J	0.0061	J	mg/Kg	SD-27-02-FW	3 / 16	0.00076 - 0.022	0.0061	N/A	1.8 N	N/A	N/A	NO	BSL
58-89-9	gamma-BHC (Lindane)	0.0019	J	0.0019	J	mg/Kg	SD-24-02-FW	1 / 16	0.00076 - 0.011	0.0019	N/A	0.44 C	N/A	N/A	NO	BSL
5103-74-2	gamma-Chlordane	0.00031	J	0.0046		mg/Kg	SD-24-03-FW	4 / 16	0.00076 - 0.011	0.0046	N/A	1.6 C	N/A	N/A	NO	BSL
76-44-8	Heptachlor	0.00084	J	0.00084	J	mg/Kg	SD-24-02-FW	1 / 16	0.00076 - 0.011	0.00084	N/A	0.11 C	N/A	N/A	NO	BSL
1024-57-3	Heptachlor Epoxide	0.00048	J	0.0014	J	mg/Kg	SD-24-02-FW	2 / 16	0.00076 - 0.011	0.0014	N/A	0.053 C	N/A	N/A	NO	BSL

TABLE 2.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Combined Reference Data ^a

CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Minimum Qualifier	Maximum Concentration ⁽¹⁾	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value ⁽²⁾	Screening Toxicity Value ⁽³⁾	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁴⁾
7429-90-5	Aluminum	1100		14300		mg/Kg	SD-SA-01-TR	17 / 17	3.5 - 9.14	14300	N/A	N/A	N/A	N/A	NO	NTX
7440-36-0	Antimony	0.5	J	5.6		mg/Kg	SD-MC-04-TR	13 / 17	0.067 - 1.4	5.6	N/A	3.1 N	N/A	N/A	YES	ASL
7440-38-2	Arsenic	3.8		44.5		mg/Kg	SD-MC-04-TR	17 / 17	0.22 - 1	44.5	N/A	0.39 C	N/A	N/A	YES	ASL
7440-39-3	Barium	5.7		173		mg/Kg	SD-MC-04-TR	17 / 17	0.018 - 0.4	173	N/A	540 N	N/A	N/A	NO	BSL
7440-41-7	Beryllium	0.15		1.2		mg/Kg	SD-24-03-FW	14 / 17	0.027 - 0.22	1.2	N/A	15 N	N/A	N/A	NO	BSL
7440-43-9	Cadmium	0.08699		6.1		mg/Kg	SD-MC-04	15 / 17	0.053 - 0.6	6.1	N/A	3.7 N	N/A	N/A	YES	ASL
7440-70-2	Calcium	610		10900		mg/Kg	SD-MC-01-TR	13 / 13	1.6 - 2.14	10900	N/A	N/A	N/A	N/A	NO	NUT
7440-47-3	Chromium	10.3	J	512		mg/Kg	SD-MC-04-TR	17 / 17	0.055 - 1	512	N/A	30 C	N/A	N/A	YES	ASL
7440-48-4	Cobalt	0.76		21.8	J	mg/Kg	SD-MC-04-TR	17 / 17	0.36 - 0.37	21.8	N/A	N/A	N/A	N/A	NO	BSL
7440-50-8	Copper	1.9		344		mg/Kg	SD-MC-04-TR	17 / 17	0.082 - 0.44	344	N/A	310 N	N/A	N/A	YES	ASL
7439-89-6	Iron	2040		51600		mg/Kg	SD-MC-04-TR	17 / 17	0.57 - 1.4	51600	N/A	N/A	N/A	N/A	NO	NTX
7439-92-1	Lead	5.6	J	581		mg/Kg	SD-24-03-FW	17 / 17	0.27 - 0.6	581	N/A	400 N	N/A	N/A	YES	ASL
7439-95-4	Magnesium	324		4370		mg/Kg	SD-24-03-FW	13 / 13	3.5 - 15.18	4370	N/A	N/A	N/A	N/A	NO	NUT
7439-96-5	Manganese	12.6	J	1980		mg/Kg	SD-MC-04-TR	17 / 17	0.018 - 0.24	1980	N/A	180 N	N/A	N/A	YES	ASL
7439-97-6	Mercury	0.021	J	0.71		mg/Kg	SD-24-03-ME	13 / 16	0.005 - 0.02	0.71	N/A	0.61 N	N/A	N/A	YES	ASL
7440-02-0	Nickel	1.1		27.3		mg/Kg	SD-HB-00-TR	17 / 17	0.15 - 0.8	27.3	N/A	160 N	N/A	N/A	NO	BSL
7440-09-7	Potassium	126		1170	J	mg/Kg	SD-24-03-ME	13 / 13	2.7 - 4.38	1170	N/A	N/A	N/A	N/A	NO	NUT
7782-49-2	Selenium	0.91	J	3	J	mg/Kg	SD-23-03-FW	7 / 17	0.053 - 1	3	N/A	39 N	N/A	N/A	NO	BSL
7440-22-4	Silver	0.085	J	2.9		mg/Kg	SD-24-03-FW	6 / 16	0.01 - 1	2.9	N/A	39 N	N/A	N/A	NO	BSL
7440-23-5	Sodium	66.5		516		mg/Kg	SD-24-03-ME	11 / 13	0.22 - 98.04	516	N/A	N/A	N/A	N/A	NO	NUT
7440-62-2	Vanadium	2.5		148		mg/Kg	SD-24-03-FW	17 / 17	0.073 - 0.64	148	N/A	55 N	N/A	N/A	YES	ASL
7440-66-6	Zinc	10.4	J	611	J	mg/Kg	SD-MC-04-TR	17 / 17	0.16 - 1.7	611	N/A	2300 N	N/A	N/A	NO	BSL

^a Data presented are from sediment samples SD-MC-01, SD-MC-01-TR, SD-MC-02, SD-MC-04, SD-MC-04-TR, SD-MC-12, SD-23-01-FW, SD-23-02-FW, SD-23-03-FW, SD-24-01-FW, SD-24-02-FW, SD-24-03-FW, SD-24-03-ME, SD-27-02-FW, SD-27-03-FW, SD-HB-00-TR, and SD-SA-01-TR.

- (1) Minimum/maximum detected concentration.
 (2) Refer to supporting information for background discussion.
 (3) USEPA Region 9 PRGs for residential soil (adjusted to a hazard quotient = 0.1 for noncarcinogens), October 1, 2002.
 The most conservative PRG for all noncarcinogenic PAHs has been used for 2-methylnaphthalene, acenaphthylene, benzo(g,h,i)perylene and phenanthrene.
 The most conservative PRG for all BHCs has been used for delta-BHC.
 PRG for endosulfan has been used for endosulfan I, endosulfan II, and endosulfan sulfate.
 PRG for endrin has been used for endrin aldehyde and endrin ketone.
 PRG for chromium VI used for chromium.
 PRG for methylmercury used for mercury.
 PRG for cis-1,2-dichloroethene has been used for 1,2-dichloroethene (total)
 The screening toxicity value for lead is the residential soil lead guidance level of 400 mg/Kg (USEPA, 1994a).
 (4) Rationale Codes Selection Reason: Above Screening Levels (ASL)
 Deletion Reason: No Toxicity Information (NTX)
 Essential Nutrient (NUT)
 Below Screening Level (BSL)

Definitions: COPC = Chemical of Potential Concern
 ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
 PRG = Preliminary Remedial Goal
 N/A = Not Applicable or Not Available
 J = Estimated Value
 C = Carcinogenic
 N = Non-Carcinogenic

TABLE 2.6
COPCs DETECTED IN SEDIMENT IN RIVER/STREAM REFERENCE SAMPLES
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Reference River/Stream^a

CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Minimum Qualifier	Maximum Concentration ⁽¹⁾	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits
56-55-3	Benzo(a)anthracene	0.21	J	1.8		mg/Kg	SD-23-02-FW	7 / 9	0.38 - 0.6
50-32-8	Benzo(a)pyrene	0.25	J	2.1		mg/Kg	SD-MC-04	7 / 9	0.38 - 0.6
205-99-2	Benzo(b)fluoranthene	0.21	J	3.0		mg/Kg	SD-MC-04	8 / 9	0.38 - 0.6
207-08-9	Benzo(k)fluoranthene	0.54	J	2.2		mg/Kg	SD-MC-04	6 / 9	0.38 - 0.6
53-70-3	Dibenz(a,h)anthracene	0.11	J	0.35	J	mg/Kg	SD-MC-04	4 / 9	0.38 - 0.6
193-39-5	Indeno(1,2,3-cd)pyrene	0.16	J	1.8		mg/Kg	SD-MC-04	5 / 9	0.38 - 0.6
85-01-8	Phenanthrene	0.22	J	3.0		mg/Kg	SD-23-02-FW	7 / 9	0.38 - 0.6
12672-29-6	Aroclor 1248	ND		ND		mg/Kg	ND	0 / 9	0.003 - 0.22
7440-36-0	Antimony	0.56	J	5.6		mg/Kg	SD-MC-04-TR	8 / 10	0.43 - 0.74
7440-38-2	Arsenic	4.1		44.5		mg/Kg	SD-MC-04-TR	10 / 10	1
7440-43-9	Cadmium	0.087		6.1		mg/Kg	SD-MC-04	8 / 10	0.053 - 0.6
7440-47-3	Chromium	12	J	512		mg/Kg	SD-MC-04-TR	10 / 10	1
7440-50-8	Copper	2		344		mg/Kg	SD-MC-04-TR	10 / 10	0.44
7439-92-1	Lead	5.6	J	369		mg/Kg	SD-MC-04-TR	10 / 10	0.6
7439-96-5	Manganese	13	J	1980		mg/Kg	SD-MC-04-TR	10 / 10	0.24
7439-97-6	Mercury	0	J	0.6		mg/Kg	SD-MC-04	7 / 9	0.0095 - 0.02
7440-62-2	Vanadium	2.5		54		mg/Kg	SD-MC-04-TR	10 / 10	0.64

^a Data presented are from sediment samples SD-MC-01, SD-MC-01-TR, SD-MC-04, SD-MC-04-TR, SD-MC-12, SD-23-01-FW, SD-23-02-FW, SD-23-03-FW, SD-27-02-FW and SD-27-03-FW; only COPCs selected on Table 2.5 appear.

(1) Minimum/maximum detected concentration.

(2) Since lead cannot be quantitatively evaluated, it has been retained on this table for comparative purposes.

Definitions: COPC = Chemical of Potential Concern
N/A = Not Applicable or Not Available
ND = Not Detected
J = Estimated Value

TABLE 2.7
COPCs DETECTED IN SEDIMENT IN WETLAND REFERENCE SAMPLES
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Reference Wetland ^a

CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Minimum Qualifier	Maximum Concentration ⁽¹⁾	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits
56-55-3	Benzo(a)anthracene	0.11	J	5.9		mg/Kg	SD-24-02-FW	5 / 6	0.067 - 0.46
50-32-8	Benzo(a)pyrene	0.13	J	5.5		mg/Kg	SD-24-02-FW	5 / 6	0.067 - 0.46
205-99-2	Benzo(b)fluoranthene	0.18	J	10		mg/Kg	SD-24-02-FW	5 / 6	0.067 - 0.46
207-08-9	Benzo(k)fluoranthene	0.40		9.6		mg/Kg	SD-24-02-FW	4 / 6	0.067 - 0.46
53-70-3	Dibenz(a,h)anthracene	0.12	J	0.50	J	mg/Kg	SD-24-02-FW	2 / 6	0.067 - 0.46
193-39-5	Indeno(1,2,3-cd)pyrene	0.21	J	1.7	J	mg/Kg	SD-24-02-FW	3 / 6	0.067 - 0.46
85-01-8	Phenanthrene	0.17	J	12		mg/Kg	SD-24-02-FW	5 / 6	0.067 - 0.57
12672-29-6	Aroclor 1248	0.29	J	0.29	J	mg/Kg	SD-24-03-ME	1 / 6	0.0032 - 0.046
7440-36-0	Antimony	0.5	J	1.2	J	mg/Kg	SD-24-03-ME	4 / 6	0.067 - 1.4
7440-38-2	Arsenic	3.8		40.6		mg/Kg	SD-24-03-FW	6 / 6	0.22 - 1
7440-43-9	Cadmium	0.22		2.9		mg/Kg	SD-HB-00-TR	6 / 6	0.35 - 0.6
7440-47-3	Chromium	10	J	410	J	mg/Kg	SD-24-03-ME	6 / 6	0.055 - 1
7440-50-8	Copper	12		130		mg/Kg	SD-24-03-ME	6 / 6	0.082 - 0.44
7439-92-1	Lead	74		581		mg/Kg	SD-24-03-FW	6 / 6	0.27 - 0.6
7439-96-5	Manganese	50	J	263		mg/Kg	SD-SA-01-TR	6 / 6	0.018 - 0.24
7439-97-6	Mercury	0	J	0.71		mg/Kg	SD-24-03-ME	5 / 6	0.005 - 0.02
7440-62-2	Vanadium	7.1		148		mg/Kg	SD-24-03-FW	6 / 6	0.073 - 0.64

^a Data presented are from sediment samples SD-24-01-FW, SD-24-02-FW, SD-24-03-FW, SD-24-03-ME, SD-HB-00-TR, and SD-SA-01-TR; only COPCs selected on Table 2.5 appear.

(1) Minimum/maximum detected concentration.

(2) Since lead cannot be quantitatively evaluated, it has been retained on this table for comparative purposes.

Definitions: COPC = Chemical of Potential Concern
N/A = Not Applicable or Not Available
J = Estimated Value

TABLE 2.8
COPCs DETECTED IN SEDIMENT IN POND/LAKE REFERENCE SAMPLES

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future Medium: Sediment Exposure Medium: Sediment Exposure Point: Reference Pond/Lake ^a

CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Minimum Qualifier	Maximum Concentration ⁽¹⁾	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits
56-55-3	Benzo(a)anthracene	ND		ND		mg/Kg	ND	0 / 1	1
50-32-8	Benzo(a)pyrene	ND		ND		mg/Kg	ND	0 / 1	1
205-99-2	Benzo(b)fluoranthene	ND		ND		mg/Kg	ND	0 / 1	1
207-08-9	Benzo(k)fluoranthene	ND		ND		mg/Kg	ND	0 / 1	1
53-70-3	Dibenz(a,h)anthracene	ND		ND		mg/Kg	ND	0 / 1	1
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ND		mg/Kg	ND	0 / 1	1
85-01-8	Phenanthrene	ND		ND		mg/Kg	ND	0 / 1	1
12672-29-6	Aroclor 1248	ND		ND		mg/Kg	ND	0 / 1	0.0104
7440-36-0	Antimony	1.4	J	1.4	J	mg/Kg	SD-MC-02	1 / 1	N/A
7440-38-2	Arsenic	29.9		30		mg/Kg	SD-MC-02	1 / 1	N/A
7440-43-9	Cadmium	2.9		2.9		mg/Kg	SD-MC-02	1 / 1	N/A
7440-47-3	Chromium	155	J	155	J	mg/Kg	SD-MC-02	1 / 1	N/A
7440-50-8	Copper	66		65.7		mg/Kg	SD-MC-02	1 / 1	N/A
7439-92-1	Lead	197		197		mg/Kg	SD-MC-02	1 / 1	N/A
7439-96-5	Manganese	837		837		mg/Kg	SD-MC-02	1 / 1	N/A
7439-97-6	Mercury	0.4		0.35		mg/Kg	SD-MC-02	1 / 1	N/A
7440-62-2	Vanadium	52		52		mg/Kg	SD-MC-02	1 / 1	N/A

^a Data presented are from sediment sample SD-MC-02; only COPCs selected on Table 2.5 appear.

(1) Minimum/maximum detected concentration.

(2) Since lead cannot be quantitatively evaluated, it has been retained on this table for comparative purposes.

Definitions: COPC = Chemical of Potential Concern

N/A = Not Applicable or Not Available

J = Estimated Value

TABLE 2.9
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
 INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Fish Tissue
 Exposure Point: Combined Reference Data*

CAS Number	Chemical	(1) Minimum Concentration	Minimum Qualifier	(1) Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	(4) Rationale for Contaminant Deletion or Selection
191-24-2	Benzo(g,h,i)perylene	0.40	J	0.40	J	mg/Kg	LF-LB-08-F	1 / 12	0.82 - 3.3	0.40	N/A	2.7 N	N/A	N/A	NO	BSL
72-54-8	4,4'-DDD	0.0064	J	0.0064	J	mg/Kg	LF-LB-15-F	1 / 13	0.00098 - 0.0049	0.0064	N/A	0.013 C	N/A	N/A	NO	BSL
72-55-9	4,4'-DDE	0.0028	J	0.032	J	mg/Kg	LF-LB-15-F	12 / 12	N/A	0.032	N/A	0.0093 C	N/A	N/A	YES	ASL
5103-71-9	alpha-Chlordane	0.00029	J	0.00033	J	mg/Kg	LF-LB-04-F	3 / 13	0.00051 - 0.0027	0.00033	N/A	0.009 C	N/A	N/A	NO	BSL
11096-82-5	Aroclor-1260	0.0051	J	0.13	J	mg/Kg	LF-LB-15-F	13 / 13	N/A	0.13	N/A	0.0016 C	N/A	N/A	YES	ASL
76-44-8	Heptachlor	0.00039	J	0.00039	J	mg/Kg	LF-LB-04-F	1 / 13	0.0005 - 0.0027	0.00039	N/A	0.0007 C	N/A	N/A	NO	BSL
1024-57-3	Heptachlor Epoxide	0.00034	J	0.00034	J	mg/Kg	LF-LB-05-F	1 / 13	0.00051 - 0.0027	0.00034	N/A	0.00035 C	N/A	N/A	NO	BSL
7429-90-5	Aluminum	0.13	J	0.48	J	mg/Kg	LF-LB-03-F	2 / 29	0.48 - 10	0.48	N/A	N/A	N/A	N/A	NO	NTX
7440-47-3	Arsenic	0.022	J	0.081	J	mg/Kg	FI-MC-PP-LMB17-F	16 / 29	0.082 - 0.1	0.081	N/A	0.0021 C	N/A	N/A	YES	ASL
7440-47-3	Barium	0.060	J	0.060	J	mg/Kg	FI-MC-PP-WS3-F	1 / 29	0.13 - 10	0.060	N/A	9.5 N	N/A	N/A	NO	BSL
7440-47-3	Chromium	0.057	J	0.810	J	mg/Kg	FI-MC-PP-WS3-F	11 / 29	0.072 - 1	0.81	N/A	0.41 N	N/A	N/A	YES	ASL
7440-48-4	Cobalt	0.0084	J	0.049	J	mg/Kg	LF-LB-03-F	6 / 29	0.039 - 10	0.049	N/A	N/A	N/A	N/A	NO	NTX
7440-50-8	Copper	0.12	J	0.27	J	mg/Kg	FI-MC-PP-WS3-F	6 / 29	0.19 - 10	0.27	N/A	5.4 N	N/A	N/A	NO	BSL
7439-89-6	Iron	5.7	J	25	J	mg/Kg	LF-LB-15-F	5 / 29	3.5 - 10	25	N/A	N/A	N/A	N/A	NO	NTX
7439-92-1	Lead	0.059	J	0.061	J	mg/Kg	LF-LB-14-F	3 / 29	0.018 - 1	0.061	N/A	N/A	N/A	N/A	YES	(5)
7439-97-6	Manganese	0.37	J	0.4	J	mg/Kg	FI-MC-PP-WS3-F	1 / 29	0.13 - 10	0.37	N/A	19 N	N/A	N/A	NO	BSL
7440-09-7	Mercury	0.1	J	1	J	mg/Kg	LF-LB-09-F	25 / 29	0.025 - 0.15	1.0	N/A	0.014 N	N/A	N/A	YES	ASL
7782-49-2	Nickel	0.016	J	0.02	J	mg/Kg	FI-MC-PP-WS3-F	1 / 29	0.039 - 10	0.016	N/A	2.7 N	N/A	N/A	NO	BSL
7440-66-6	Potassium	3560	J	4650	J	mg/Kg	LF-LB-14-F	13 / 13	N/A	4650	N/A	N/A	N/A	N/A	NO	NUT
7440-66-6	Selenium	0.52	J	0.8	J	mg/Kg	LF-LB-06-F	16 / 29	0.5	0.80	N/A	0.68 N	N/A	N/A	YES	ASL
7440-66-6	Vanadium	0.04	J	0.04	J	mg/Kg	FI-MC-PP-WS3-F	1 / 29	0.045 - 0.5	0.040	N/A	0.14 N	N/A	N/A	NO	BSL
7440-66-6	Zinc	3.3	J	8.3	J	mg/Kg	FI-MC-PP-WS13-F	25 / 29	4.3 - 5.2	8.3	N/A	41 N	N/A	N/A	NO	BSL

* Data presented are from all fish tissue samples LF-LB-01-F, LF-LB-02-F, LF-LB-03-F, LF-LB-04-F, LF-LB-05-F, LF-LB-06-F, LF-LB-07-F, LF-LB-08-F, LF-LB-09-F, LF-LB-10-F, LF-LB-14-F, LF-LB-15-F, LF-LB-16-F, FI-MC-PP-BB1-F, FI-MC-PP-LMB15-F, FI-MC-PP-LMB17-F, FI-MC-PP-LMB2-F, FI-MC-PP-LMB5-F, FI-MC-PP-LMB6-F, FI-MC-PP-WS11-F, FI-MC-PP-WS13-F, FI-MC-PP-WS1-F, FI-MC-PP-WS3-F, FI-MC-PP-WS8-F, FI-MC-SP-LMB12-F, FI-MC-SP-LMB2-F, FI-MC-SP-LMB4-F, FI-MC-SP-LMB5-F, and FI-MC-SP-LMB9-F.

- (1) Minimum/maximum detected concentration.
 (2) Refer to supporting information for background discussion.
 (3) USEPA Region III RBCs for fish (adjusted to a hazard quotient = 0.1 for noncarcinogens), April 14, 2004.
 RBC for chlordane has been used for alpha-chlordane.
 RBC for PCBs has been used for Aroclor-1260.
 RBC for chromium VI has been used for chromium.
 RBC for methylmercury has been used for mercury.
 RBC for naphthalene has been used for benzo(g,h,i)perylene.

Definitions:
 SQL = Sample Quantitation Limit
 COPC = Chemical of Potential Concern
 ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
 RBC = Risk-Based Concentration
 N/A = Not Applicable or Not Available
 J = Estimated Value
 C = Carcinogenic
 N = Non-Carcinogenic

- (4) Rationale Codes Selection Reason: Above Screening Levels (ASL)
 Deletion Reason: No Toxicity Information (NTX)
 Essential Nutrient (NUT)
 Below Screening Level (BSL)

- (5) Retained for comparison purposes.

TABLE 3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: River/Stream

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Detected Concentration (1)	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
							Arsenic	Wg/L	4.5E+00	1.9E+01	1.6E+01	J
Lead (4)	Wg/L	1.2E+01	2.6E+02	5.1E+01		Wg/L	5.1E+01	Max	(2)	1.2E+01	Mean	(3)
Manganese	Wg/L	6.5E+02	1.4E+03	2.0E+03		Wg/L	1.4E+03	95% UCL		1.4E+03	95% UCL	
Mercury	Wg/L	5.8E-02	9.9E-02	1.1E-01		Wg/L	9.9E-02	95% UCL		9.9E-02	95% UCL	

(1) Data are from surface water samples SW-MC-01, SW-MC-04, SW-MC-12, SW-23-01 and SW-27-01; only COPCs selected on Table 2.1 and detected at this exposure point appear.

(2) Due to the small sample size, the maximum detected concentration is used.

(3) When the maximum detected concentration is selected as the RME EPC, the arithmetic mean concentration is selected as the CT EPC.

(4) Since lead cannot be quantitatively evaluated, it has been retained on this table for comparative purposes.

-- Not detected at this exposure point.

J = Estimated Concentration

Max = Maximum Detected Concentration

N/A = Not Applicable

UCL = Upper Confidence Limit

EPC = Exposure Point Concentration

TABLE 3.2
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future Medium: Surface Water Exposure Medium: Surface Water Exposure Point: Wetland
--

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Detected Concentration (1)	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
							Arsenic	Wg/L	3.2E+00	N/A	3.2E+00	
Lead ⁽³⁾	Wg/L	6.3E+00	N/A	6.3E+00		Wg/L	6.3E+00	Max	(2)	6.3E+00	Max	(2)
Manganese	Wg/L	5.2E+02	N/A	5.2E+02		Wg/L	5.2E+02	Max	(2)	5.2E+02	Max	(2)
Mercury	Wg/L	1.3E-01	N/A	1.3E-01		Wg/L	1.3E-01	Max	(2)	1.3E-01	Max	(2)

(1) Data are from surface water sample SW-24-01; only COPCs selected on Table 2.1 and detected at this exposure point appear.

(2) Due to the small sample size, the maximum detected concentration is used.

(3) Since lead cannot be quantitatively evaluated, it has been retained on this table for comparative purposes.

-- Not detected at this exposure point.

J = Estimated Concentration

Max = Maximum Detected Concentration

N/A = Not Applicable

UCL = Upper Confidence Limit

EPC = Exposure Point Concentration

TABLE 3.3
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future Medium: Surface Water Exposure Medium: Surface Water Exposure Point: Pond/Lake
--

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Detected Concentration (1)	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
bis(2-Ethylhexyl)phthalate	Wg/L	2.5E+00	2.8E+00	3.0E+00	J	Wg/L	2.8E+00	95% UCL		2.8E+00	95% UCL	
Arsenic	Wg/L	1.6E+00	2.8E+00	2.9E+00	J	Wg/L	2.8E+00	95% UCL		2.8E+00	95% UCL	
Lead (4)	Wg/L	1.6E+00	2.8E+00	3.2E+00	J	Wg/L	2.8E+00	95% UCL		2.8E+00	95% UCL	
Manganese	Wg/L	2.4E+02	3.7E+02	4.3E+02		Wg/L	3.7E+02	95% UCL		3.7E+02	95% UCL	
Mercury	Wg/L	4.3E-02	1.2E-01	1.2E-01		Wg/L	1.2E-01	Max	(2)	4.3E-02	Mean	(3)

(1) Data are from surface water samples SW-25-01, SW-26-01, SW-MC-02, SW-MC-03, and SW-MC-03-01; only COPCs selected on Table 2.1 and detected at this exposure point appear.

(2) Due to the small sample size, the maximum detected concentration is used.

(3) When the maximum detected concentration is selected as the RME EPC, the arithmetic mean concentration is selected as the CT EPC.

(4) Since lead cannot be quantitatively evaluated, it has been retained on this table for comparative purposes.

-- Not detected at this exposure point.

J = Estimated Concentration

Max = Maximum Detected Concentration

N/A = Not Applicable

UCL = Upper Confidence Limit

EPC = Exposure Point Concentration

TABLE 3.4
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Detected Concentration (1)	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	mg/kg	1.8E+00	1.3E+00	1.8E+00	J	mg/kg	1.3E+00	95% UCL	(2)	1.3E+00	95% UCL	(2)
Benzo(a)pyrene	mg/kg	2.1E+00	1.4E+00	2.1E+00		mg/kg	1.4E+00	95% UCL		1.4E+00	95% UCL	
Benzo(b)fluoranthene	mg/kg	3.0E+00	1.8E+00	3.0E+00		mg/kg	1.8E+00	95% UCL		1.8E+00	95% UCL	
Benzo(k)fluoranthene	mg/kg	2.2E+00	1.6E+00	2.2E+00		mg/kg	1.6E+00	95% UCL		1.6E+00	95% UCL	
Dibenz(a,h)anthracene	mg/kg	3.5E-01	2.8E-01	3.5E-01		mg/kg	2.8E-01	95% UCL		2.8E-01	95% UCL	
Indeno(1,2,3-cd)pyrene	mg/kg	1.8E+00	1.1E+00	1.8E+00		mg/kg	1.1E+00	95% UCL		1.1E+00	95% UCL	
Phenanthrene	mg/kg	3.0E+00	1.7E+00	3.0E+00		mg/kg	1.7E+00	95% UCL		1.7E+00	95% UCL	
Aroclor 1248	mg/kg	ND	ND	ND		mg/kg	ND	Max		ND	Max	
Antimony	mg/kg	5.6E+00	2.5E+00	5.6E+00	mg/kg	2.5E+00	95% UCL	2.5E+00	95% UCL			
Arsenic	mg/kg	4.5E+01	2.6E+01	4.5E+01	mg/kg	2.6E+01	95% UCL	2.6E+01	95% UCL			
Cadmium	mg/kg	6.1E+00	4.6E+00	6.1E+00	mg/kg	4.6E+00	95% UCL	4.6E+00	95% UCL			
Chromium	mg/kg	5.1E+02	3.5E+02	5.1E+02	mg/kg	3.5E+02	95% UCL	3.5E+02	95% UCL			
Copper	mg/kg	3.4E+02	2.2E+02	3.4E+02	mg/kg	2.2E+02	95% UCL	2.2E+02	95% UCL			
Lead ⁴	mg/kg	3.7E+02	2.6E+02	3.7E+02	mg/kg	2.6E+02	95% UCL	2.6E+02	95% UCL			
Manganese	mg/kg	2.0E+03	1.4E+03	2.0E+03	mg/kg	1.4E+03	95% UCL	1.4E+03	95% UCL			
Mercury	mg/kg	6.0E-01	4.8E-01	6.0E-01	mg/kg	4.8E-01	95% UCL	4.8E-01	95% UCL			
Vanadium	mg/kg	5.4E+01	3.4E+01	5.4E+01	mg/kg	3.4E+01	95% UCL	3.4E+01	95% UCL			

(1) Data presented are from sediment samples SD-MC-01, SD-MC-01-TR, SD-MC-04, SD-MC-04-TR, SD-MC-12, SD-23-01-FW, SD-23-02-FW, SD-23-03-FW, SD-27-02-FW, and SD-27-03-FW;

only COPCs selected on Table 2.5 and detected at this exposure point appear.

(2) Due to the small sample size, the maximum detected concentration is used.

(3) When the maximum detected concentration is selected as the RME EPC, the arithmetic mean concentration is selected as the CT EPC.

(4) Since lead cannot be quantitatively evaluated, it has been retained on this table for comparative purposes.

J = Estimated Concentration

Max = Maximum Detected Concentration

N/A = Not Applicable

UCL = Upper Confidence Limit

EPC = Exposure Point Concentration

RME = Reasonable Maximum Exposure

CT = Central Tendency

TABLE 3.5
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Detected Concentration (1)	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	mg/kg	5.9E+00	5.4E+00	5.9E+00		mg/kg	5.4E+00	95% UCL		5.4E+00	95% UCL	
Benzo(a)pyrene	mg/kg	5.5E+00	4.9E+00	5.5E+00		mg/kg	4.9E+00	95% UCL		4.9E+00	95% UCL	
Benzo(b)fluoranthene	mg/kg	1.0E+01	9.4E+00	1.0E+01		mg/kg	9.4E+00	95% UCL		9.4E+00	95% UCL	
Benzo(k)fluoranthene	mg/kg	9.6E+00	9.5E+00	9.6E+00		mg/kg	9.5E+00	95% UCL		9.5E+00	95% UCL	
Dibenz(a,h)anthracene	mg/kg	5.0E-01	3.5E-01	5.0E-01	J	mg/kg	3.5E-01	95% UCL		3.5E-01	95% UCL	
Indeno(1,2,3-cd)pyrene	mg/kg	1.7E+00	1.4E+00	1.7E+00	J	mg/kg	1.4E+00	95% UCL		1.4E+00	95% UCL	
Phenanthrene	mg/kg	1.2E+01	2.5E+01	1.2E+01		mg/kg	1.2E+01	Max	(2)	1.2E+01	Max	(2)
Aroclor 1248	mg/kg	2.9E-01	2.6E-01	2.9E-01	J	mg/kg	2.6E-01	95% UCL		2.6E-01	95% UCL	
Antimony	mg/kg	1.2E+00	1.0E+00	1.2E+00	J	mg/kg	1.0E+00	95% UCL		1.0E+00	95% UCL	
Arsenic	mg/kg	4.1E+01	3.3E+01	4.1E+01		mg/kg	3.3E+01	95% UCL		3.3E+01	95% UCL	
Cadmium	mg/kg	2.9E+00	2.2E+00	2.9E+00		mg/kg	2.2E+00	95% UCL		2.2E+00	95% UCL	
Chromium	mg/kg	4.1E+02	5.4E+02	4.1E+02	J	mg/kg	4.1E+02	Max	(2)	4.1E+02	Max	(2)
Copper	mg/kg	1.3E+02	9.3E+01	1.3E+02		mg/kg	9.3E+01	95% UCL		9.3E+01	95% UCL	
Lead ⁴	mg/kg	5.8E+02	5.2E+02	5.8E+02		mg/kg	5.2E+02	95% UCL		5.2E+02	95% UCL	
Manganese	mg/kg	2.6E+02	2.1E+02	2.6E+02		mg/kg	2.1E+02	95% UCL		2.1E+02	95% UCL	
Mercury	mg/kg	7.1E-01	1.3E+00	7.1E-01		mg/kg	7.1E-01	Max	(2)	7.1E-01	Max	(2)
Vanadium	mg/kg	1.5E+02	9.9E+01	1.5E+02		mg/kg	9.9E+01	95% UCL		9.9E+01	95% UCL	

(1) Data presented are from sediment samples SD-24-01-FW, SD-24-02-FW, SD-24-03-FW, SD-24-03-ME, SD-HB-00-TR, and SD-SA-01-TR; only COPCs selected on Table 2.5 and detected at this exposure point appear.

(2) Due to the small sample size, the maximum detected concentration is used.

(3) When the maximum detected concentration is selected as the RME EPC, the arithmetic mean concentration is selected as the CT EPC.

(4) Since lead cannot be quantitatively evaluated, it has been retained on this table for comparative purposes.

J = Estimated Concentration

Max = Maximum Detected Concentration

N/A = Not Applicable

UCL = Upper Confidence Limit

EPC = Exposure Point Concentration

RME = Reasonable Maximum Exposure

CT = Central Tendency

TABLE 3.6
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Pond/Lake

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Detected Concentration (1)	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	mg/kg	ND	ND	ND		mg/kg	ND	Max	(2)	ND	Max	(2)
Benzo(a)pyrene	mg/kg	ND	ND	ND		mg/kg	ND	Max	(2)	ND	Max	(2)
Benzo(b)fluoranthene	mg/kg	ND	ND	ND		mg/kg	ND	Max	(2)	ND	Max	(2)
Benzo(k)fluoranthene	mg/kg	ND	ND	ND		mg/kg	ND	Max	(2)	ND	Max	(2)
Dibenz(a,h)anthracene	mg/kg	ND	ND	ND		mg/kg	ND	Max	(2)	ND	Max	(2)
Indeno(1,2,3-cd)pyrene	mg/kg	ND	ND	ND		mg/kg	ND	Max	(2)	ND	Max	(2)
Phenanthrene	mg/kg	ND	ND	ND		mg/kg	ND	Max	(2)	ND	Max	(2)
Aroclor 1248	mg/kg	ND	ND	ND		mg/kg	ND	Max	(2)	ND	Max	(2)
Antimony	mg/kg	1.4E+00	N/A	1.4E+00	J	mg/kg	1.4E+00	Max	(2)	1.4E+00	Max	(2)
Arsenic	mg/kg	3.0E+01	N/A	3.0E+01		mg/kg	3.0E+01	Max	(2)	3.0E+01	Max	(2)
Cadmium	mg/kg	2.9E+00	N/A	2.9E+00		mg/kg	2.9E+00	Max	(2)	2.9E+00	Max	(2)
Chromium	mg/kg	1.6E+02	N/A	1.6E+02	J	mg/kg	1.6E+02	Max	(2)	1.6E+02	Max	(2)
Copper	mg/kg	6.6E+01	N/A	6.6E+01		mg/kg	6.6E+01	Max	(2)	6.6E+01	Max	(2)
Lead ⁴	mg/kg	2.0E+02	N/A	2.0E+02		mg/kg	2.0E+02	Max	(2)	2.0E+02	Max	(2)
Manganese	mg/kg	8.4E+02	N/A	8.4E+02		mg/kg	8.4E+02	Max	(2)	8.4E+02	Max	(2)
Mercury	mg/kg	3.5E-01	N/A	3.5E-01		mg/kg	3.5E-01	Max	(2)	3.5E-01	Max	(2)
Vanadium	mg/kg	5.2E+01	N/A	5.2E+01		mg/kg	5.2E+01	Max	(2)	5.2E+01	Max	(2)

(1) Data presented are from sediment sample SD-MC-02; only COPCs selected on Table 2.5 and detected at this exposure point appear.

(2) Due to the small sample size, the maximum detected concentration is used.

(3) When the maximum detected concentration is selected as the RME EPC, the arithmetic mean concentration is selected as the CT EPC.

(4) Since lead cannot be quantitatively evaluated, it has been retained on this table for comparative purposes.

J = Estimated Concentration

Max = Maximum Detected Concentration

N/A = Not Applicable

UCL = Upper Confidence Limit

EPC = Exposure Point Concentration

RME = Reasonable Maximum Exposure

CT = Central Tendency

TABLE 3.7
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current / Future
Medium: Surface Water
Exposure Medium: Fish Tissue
Exposure Point: Fillet, Reference Locations

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration (1)	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
4,4'-DDE	mg/kg	9.1E-03	1.4E-02	3.2E-02	J	mg/kg	1.4E-02	95% UCL	(2)	1.4E-02	95% UCL	(4)
Aroclor-1260	mg/kg	2.2E-02	6.3E-02	1.3E-01	J	mg/kg	6.3E-02	95% UCL		6.3E-02	95% UCL	
Arsenic	mg/kg	4.4E-02	4.8E-02	8.1E-02	J	mg/kg	4.8E-02	95% UCL		4.8E-02	95% UCL	
Chromium	mg/kg	3.2E-01	7.5E-01	8.1E-01	J	mg/kg	7.5E-01	95% UCL		7.5E-01	95% UCL	
Lead	mg/kg	2.8E-01	7.1E-01	6.1E-02		mg/kg	6.1E-02	Max		6.1E-02	Max	
Mercury	mg/kg	3.1E-01	4.1E-01	1.0E+00		mg/kg	4.1E-01	95% UCL		4.1E-01	95% UCL	
Selenium	mg/kg	4.5E-01	5.1E-01	8.0E-01	J	mg/kg	5.1E-01	95% UCL		5.1E-01	95% UCL	

(1) Data are from fish samples LF-LB-01-F, LF-LB-02-F, LF-LB-03-F, LF-LB-04-F, LF-LB-05-F, LF-LB-06-F, LF-LB-07-F, LF-LB-08-F, LF-LB-09-F, LF-LB-10-F, LF-LB-14-F, LF-LB-15-F & LF-LB-16-F; only COPCs selected on Table 2.9 and detected for this exposure point appear.

(2) Due to the small sample size, the maximum detected concentration is used.

(3) When the maximum detected concentration is selected as the RME EPC, the arithmetic mean concentration is selected as the CT EPC.

J = Estimated Concentration

Max = Maximum Detected Concentration

N/A = Not Applicable

UCL = Upper Confidence Limit

EPC = Exposure Point Concentration

RME = Reasonable Maximum Exposure

CT = Central Tendency

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: All Stations
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CW	Chemical Concentration in Water	Wg/L	see Tables 3.1 and 3.2	see Tables 3.1 and 3.2	see Tables 3.1 and 3.2	see Tables 3.1 and 3.2	Organics: Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{DA \times SA \times EV \times EF \times ED}{BW \times AT}$ Inorganics: CDI (mg/kg-day) = $\frac{CW \times SA \times PC \times ET \times EV \times EF \times ED \times CF1 \times CF2}{BW \times AT}$
	DA	Dose Absorbed per Unit Area per Event	mg/cm ² -event	see Appendix 6I	USEPA, 2001b	see Appendix 6I	USEPA, 2001b	
	SA	Skin Surface Area Available for Contact	cm ²	5,700	USEPA, 2001b	5,700	USEPA, 2001b	
	PC	Permeability Constant	cm/hr	chemical specific	USEPA, 2001b	chemical specific	USEPA, 2001b	
	ET	Event Time	hrs/event	1	Prof. Judgement	0.5	Prof. Judgement	
	EV	Event Frequency	events/day	1	Prof. Judgement	1	Prof. Judgement	
	EF	Exposure Frequency	days/year	26	assumption	26	assumption	
	ED	Exposure Duration	years	24	USEPA, 1994b	7	USEPA, 1994b	
	BW	Body Weight	kg	70	USEPA, 1994b	70	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	2,555	USEPA, 1989	
	CF1	Conversion Factor 1	L/cm ³	0.001	--	0.001	--	
	CF2	Conversion Factor 2	mg/Wg	0.001	--	0.001	--	

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: All Stations
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CW	Chemical Concentration in Water	Wg/L	see Tables 3.1 and 3.2	see Tables 3.1 and 3.2	see Tables 3.1 and 3.2	see Tables 3.1 and 3.2	Organics: Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{DA \times SA \times EV \times EF \times ED}{BW \times AT}$ Inorganics: CDI (mg/kg-day) = $\frac{CW \times SA \times PC \times ET \times EV \times EF \times ED \times CF1 \times CF2}{BW \times AT}$
	DA	Dose Absorbed per Unit Area per Event	mg/cm ² -event	see Appendix 6I	USEPA, 2001b	see Appendix 6I	USEPA, 2001b	
	SA	Skin Surface Area Available for Contact	cm ²	2,800	USEPA, 2001b	2,800	USEPA, 2001b	
	PC	Permeability Constant	cm/hr	chemical specific	USEPA, 2001b	chemical specific	USEPA, 2001b	
	ET	Event Time	hrs/event	1	Prof. Judgement	0.5	Prof. Judgement	
	EV	Event Frequency	events/day	1	Prof. Judgement	1	Prof. Judgement	
	EF	Exposure Frequency	days/year	26	assumption	26	assumption	
	ED	Exposure Duration	years	6	USEPA, 1994b	2	USEPA, 1994b	
	BW	Body Weight	kg	15	USEPA, 1994b	15	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	730	USEPA, 1989	
CF1	Conversion Factor 1	L/cm ³	0.001	--	0.001	--		
CF2	Conversion Factor 2	mg/Wg	0.001	--	0.001	--		

TABLE 4.3
VALUES USED FOR DAILY INTAKE CALCULATIONS

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: All Stations
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CW	Chemical Concentration in Water	Wg/L	see Tables 3.1 and 3.2	see Tables 3.1 and 3.2	see Tables 3.1 and 3.2	see Tables 3.1 and 3.2	Organics: Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{DA \times SA \times EV \times EF \times ED}{BW \times AT}$ Inorganics: CDI (mg/kg-day) = $\frac{CW \times SA \times PC \times ET \times EV \times EF \times ED \times CF1 \times CF2}{BW \times AT}$
	DA	Dose Absorbed per Unit Area per Event	mg/cm ² -event	see Appendix 6I	USEPA, 2001b	see Appendix 6I	USEPA, 2001b	
	SA	Skin Surface Area Available for Contact	cm ²	5,700	USEPA, 2001b	5,700	USEPA, 2001b	
	PC	Permeability Constant	cm/hr	chemical specific	USEPA, 2001b	chemical specific	USEPA, 2001b	
	ET	Event Time	hrs/event	1	Prof. Judgement	0.5	Prof. Judgement	
	EV	Event Frequency	events/day	1	Prof. Judgement	1	Prof. Judgement	
	EF	Exposure Frequency	days/year	104	assumption	78	assumption	
	ED	Exposure Duration	years	24	USEPA, 1994b	7	USEPA, 1994b	
	BW	Body Weight	kg	70	USEPA, 1994b	70	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	2,555	USEPA, 1989	
	CF1	Conversion Factor 1	L/cm ³	0.001	--	0.001	--	
	CF2	Conversion Factor 2	mg/Wg	0.001	--	0.001	--	

TABLE 4.4
VALUES USED FOR DAILY INTAKE CALCULATIONS

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: All Stations
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	CW	Chemical Concentration in Water	Wg/L	see Tables 3.1 and 3.2	see Tables 3.1 and 3.2	see Tables 3.1 and 3.2	see Tables 3.1 and 3.2	Organics: Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{DA \times SA \times EV \times EF \times ED}{BW \times AT}$ Inorganics: CDI (mg/kg-day) = $\frac{CW \times SA \times PC \times ET \times EV \times EF \times ED \times CF1 \times CF2}{BW \times AT}$
	DA	Dose Absorbed per Unit Area per Event	mg/cm ² -event	see Appendix 6I	USEPA, 2001b	see Appendix 6I	USEPA, 2001b	
	SA	Skin Surface Area Available for Contact	cm ²	2,800	USEPA, 2001b	2,800	USEPA, 2001b	
	PC	Permeability Constant	cm/hr	chemical specific	USEPA, 2001b	chemical specific	USEPA, 2001b	
	ET	Event Time	hrs/event	1	Prof. Judgement	0.5	Prof. Judgement	
	EV	Event Frequency	events/day	1	Prof. Judgement	1	Prof. Judgement	
	EF	Exposure Frequency	days/year	104	assumption	78	assumption	
	ED	Exposure Duration	years	6	USEPA, 1994b	2	USEPA, 1994b	
	BW	Body Weight	kg	15	USEPA, 1994b	15	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	730	USEPA, 1989	
CF1	Conversion Factor 1	L/cm ³	0.001	--	0.001	--		
CF2	Conversion Factor 2	mg/Wg	0.001	--	0.001	--		

TABLE 4.5
VALUES USED FOR DAILY INTAKE CALCULATIONS

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: Recreational User
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	Wg/L	see Table 3.3	see Table 3.3	see Table 3.3	see Table 3.3	Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{CW \times IR \times ET \times EF \times ED \times CF1 \times CF2}{BW \times AT}$
	IR	Ingestion Rate of Water	mL/hr	50	USEPA, 1989	50	USEPA, 1989	
	ET	Exposure Time	hrs/day	1	Prof. Judgement	0.5	Prof. Judgement	
	EF	Exposure Frequency	days/year	39	assumption	5	assumption	
	ED	Exposure Duration	years	24	USEPA, 1994b	7	USEPA, 1994b	
	BW	Body Weight	kg	70	USEPA, 1994b	70	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	2,555	USEPA, 1989	
	CF1	Conversion Factor 1	mg/Wg	0.001	--	0.001	--	
CF2	Conversion Factor 2	L/mL	0.001	--	0.001	--		
Dermal	CW	Chemical Concentration in Water	Wg/L	see Table 3.3	see Table 3.3	see Table 3.3	see Table 3.3	Organics: Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{DA \times SA \times EV \times EF \times ED}{BW \times AT}$ Inorganics: CDI (mg/kg-day) = $\frac{CW \times SA \times PC \times ET \times EV \times EF \times ED \times CF1 \times CF2}{BW \times AT}$
	DA	Dose Absorbed per Unit Area per Event	mg/cm ² -event	see Appendix 6I	USEPA, 2001b	see Appendix 6I	USEPA, 2001b	
	SA	Skin Surface Area Available for Contact	cm ²	18,000	USEPA, 2001b	18,000	USEPA, 2001b	
	PC	Permeability Constant	cm/hr	chemical specific	USEPA, 2001b	chemical specific	USEPA, 2001b	
	ET	Event Time	hrs/event	1	Prof. Judgement	0.5	Prof. Judgement	
	EV	Event Frequency	event/day	1	Prof. Judgement	1	Prof. Judgement	
	EF	Exposure Frequency	days/year	39	assumption	5	assumption	
	ED	Exposure Duration	years	24	USEPA, 1994b	7	USEPA, 1994b	
	BW	Body Weight	kg	70	USEPA, 1994b	70	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	2,555	USEPA, 1989	
	CF1	Conversion Factor 1	L/cm ³	0.001	--	0.001	--	
	CF2	Conversion Factor 2	mg/Wg	0.001	--	0.001	--	

TABLE 4.6
VALUES USED FOR DAILY INTAKE CALCULATIONS

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: Recreational User
Receptor Age: Young Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	Wg/L	see Table 3.3	see Table 3.3	see Table 3.3	see Table 3.3	Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{CW \times IR \times ET \times EF \times ED \times CF1 \times CF2}{BW \times AT}$
	IR	Ingestion Rate of Water	mL/hr	50	USEPA, 1989	50	USEPA, 1989	
	ET	Exposure Time	hrs/day	1	Prof. Judgement	0.5	Prof. Judgement	
	EF	Exposure Frequency	days/year	39	assumption	5	assumption	
	ED	Exposure Duration	years	6	USEPA, 1994b	2	USEPA, 1994b	
	BW	Body Weight	kg	15	USEPA, 1994b	15	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	730	USEPA, 1989	
	CF1	Conversion Factor 1	mg/Wg	0.001	--	0.001	--	
CF2	Conversion Factor 2	L/mL	0.001	--	0.001	--		
Dermal	CW	Chemical Concentration in Water	Wg/L	see Table 3.3	see Table 3.3	see Table 3.3	see Table 3.3	Organics: Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{DA \times SA \times EV \times EF \times ED}{BW \times AT}$
	DA	Dose Absorbed per Unit Area per Event	mg/cm ² -event	see Appendix 6l	USEPA, 2001b	see Appendix 6l	USEPA, 2001b	
	SA	Skin Surface Area Available for Contact	cm ²	6,600	USEPA, 2001b	6,600	USEPA, 2001b	
	PC	Permeability Constant	cm/hr	chemical specific	USEPA, 2001b	chemical specific	USEPA, 2001b	Inorganics: CDI (mg/kg-day) = $\frac{CW \times SA \times PC \times ET \times EV \times EF \times ED \times CF1 \times CF2}{BW \times AT}$
	ET	Event Time	hrs/event	1	Prof. Judgement	0.5	Prof. Judgement	
	EV	Event Frequency	event/day	1	Prof. Judgement	1	Prof. Judgement	
	EF	Exposure Frequency	days/year	39	assumption	5	assumption	
	ED	Exposure Duration	years	6	USEPA, 1994b	2	USEPA, 1994b	
	BW	Body Weight	kg	15	USEPA, 1994b	15	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	730	USEPA, 1989	
	CF1	Conversion Factor 1	L/cm ³	0.001	--	0.001	--	
	CF2	Conversion Factor 2	mg/Wg	0.001	--	0.001	--	

TABLE 4.7
VALUES USED FOR DAILY INTAKE CALCULATIONS

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: All Stations
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Sediment	mg/kg	see Tables 3.1 through 3.3	Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{CS \times IR \times FI \times EF \times ED \times CF}{BW \times AT}$			
	IR	Ingestion Rate of Sediment	mg/day	100	USEPA, 1994b	50	USEPA, 1994b	
	FI	Fraction Ingested	unitless	0.5	Prof. Judgement	0.5	Prof. Judgement	
	EF	Exposure Frequency	days/year	26	assumption	26	assumption	
	ED	Exposure Duration	years	24	USEPA, 1994b	7	USEPA, 1994b	
	BW	Body Weight	kg	70	USEPA, 1994b	70	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	2,555	USEPA, 1989	
	CF	Conversion Factor	kg/mg	0.000001	--	0.000001	--	
Dermal	CS	Chemical Concentration in Soil	mg/kg	see Tables 3.1 through 3.3	CDI (mg/kg-day) = $\frac{CS \times SA \times AF \times EF \times ED \times DAF \times CF}{BW \times AT}$			
	SA	Skin Surface Area Available for Contact	cm ²	5,700	USEPA, 2001b	5,700	USEPA, 2001b	
	AF	Skin Adherence Factor	mg/cm ² -day	0.07	USEPA, 2001b	0.07	USEPA, 2001b	
	EF	Exposure Frequency	days/year	26	assumption	26	assumption	
	ED	Exposure Duration	years	24	USEPA, 1994b	7	USEPA, 1994b	
	DAF	Dermal Absorption Factor	--	chemical specific	--	chemical specific	--	
	BW	Body Weight	kg	70	USEPA, 1994b	70	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	2,555	USEPA, 1989	
CF	Conversion Factor	kg/mg	0.000001	--	0.000001	--		

TABLE 4.8
VALUES USED FOR DAILY INTAKE CALCULATIONS

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: All Stations
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Sediment	mg/kg	see Tables 3.1 through 3.3	Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{CS \times IR \times FI \times EF \times ED \times CF}{BW \times AT}$			
	IR	Ingestion Rate of Sediment	mg/day	200	USEPA, 1994b	100	USEPA, 1994b	
	FI	Fraction Ingested	unitless	0.5	Prof. Judgement	0.5	Prof. Judgement	
	EF	Exposure Frequency	days/year	26	assumption	26	assumption	
	ED	Exposure Duration	years	6	USEPA, 1994b	2	USEPA, 1994b	
	BW	Body Weight	kg	15	USEPA, 1994b	15	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	730	USEPA, 1989	
CF	Conversion Factor	kg/mg	0.000001	--	0.000001	--		
Dermal	CS	Chemical Concentration in Soil	mg/kg	see Tables 3.1 through 3.3	CDI (mg/kg-day) = $\frac{CS \times SA \times AF \times EF \times ED \times DAF \times CF}{BW \times AT}$			
	SA	Skin Surface Area Available for Contact	cm ²	2,800	USEPA, 2001b	2,800	USEPA, 2001b	
	AF	Skin Adherence Factor	mg/cm ² -day	0.3	USEPA, 2001b	0.3	USEPA, 2001b	
	EF	Exposure Frequency	days/year	26	assumption	26	assumption	
	ED	Exposure Duration	years	6	USEPA, 1994b	2	USEPA, 1994b	
	DAF	Dermal Absorption Factor	--	chemical specific	--	chemical specific	--	
	BW	Body Weight	kg	15	USEPA, 1994b	15	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	730	USEPA, 1989		
CF	Conversion Factor	kg/mg	0.000001	--	0.000001	--		

TABLE 4.9
VALUES USED FOR DAILY INTAKE CALCULATIONS

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: All Stations
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CS	Chemical Concentration in Sediment	mg/kg	see Tables 3.1 through 3.3	Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{CS \times IR \times FI \times EF \times ED \times CF}{BW \times AT}$			
	IR	Ingestion Rate of Sediment	mg/day	100	USEPA, 1994b	50	USEPA, 1994b	
	FI	Fraction Ingested	unitless	0.5	Prof. Judgement	0.5	Prof. Judgement	
	EF	Exposure Frequency	days/year	104	assumption	78	assumption	
	ED	Exposure Duration	years	24	USEPA, 1994b	7	USEPA, 1994b	
	BW	Body Weight	kg	70	USEPA, 1994b	70	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	2,555	USEPA, 1989	
	CF	Conversion Factor	kg/mg	0.000001	--	0.000001	--	
Dermal	CS	Chemical Concentration in Soil	mg/kg	see Tables 3.1 through 3.3	CDI (mg/kg-day) = $\frac{CS \times SA \times AF \times EF \times ED \times DAF \times CF}{BW \times AT}$			
	SA	Skin Surface Area Available for Contact	cm ²	5,700	USEPA, 2001b	5,700	USEPA, 2001b	
	AF	Skin Adherence Factor	mg/cm ² -day	0.07	USEPA, 2001b	0.07	USEPA, 2001b	
	EF	Exposure Frequency	days/year	104	assumption	78	assumption	
	ED	Exposure Duration	years	24	USEPA, 1994b	7	USEPA, 1994b	
	DAF	Dermal Absorption Factor	--	chemical specific	--	chemical specific	--	
	BW	Body Weight	kg	70	USEPA, 1994b	70	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	2,555	USEPA, 1989	
CF	Conversion Factor	kg/mg	0.000001	--	0.000001	--		

TABLE 4.10
VALUES USED FOR DAILY INTAKE CALCULATIONS

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: All Stations
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Sediment	mg/kg	see Tables 3.1 through 3.3	Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{CS \times IR \times FI \times EF \times ED \times CF}{BW \times AT}$			
	IR	Ingestion Rate of Sediment	mg/day	200	USEPA, 1994b	100	USEPA, 1994b	
	FI	Fraction Ingested	unitless	0.5	Prof. Judgement	0.5	Prof. Judgement	
	EF	Exposure Frequency	days/year	104	assumption	78	assumption	
	ED	Exposure Duration	years	6	USEPA, 1994b	2	USEPA, 1994b	
	BW	Body Weight	kg	15	USEPA, 1994b	15	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	730	USEPA, 1989	
CF	Conversion Factor	kg/mg	0.000001	--	0.000001	--		
Dermal	CS	Chemical Concentration in Soil	mg/kg	see Tables 3.1 through 3.3	CDI (mg/kg-day) = $\frac{CS \times SA \times AF \times EF \times ED \times DAF \times CF}{BW \times AT}$			
	SA	Skin Surface Area Available for Contact	cm ²	2,800	USEPA, 2001b	2,800	USEPA, 2001b	
	AF	Skin Adherence Factor	mg/cm ² -day	0.3	USEPA, 2001b	0.3	USEPA, 2001b	
	EF	Exposure Frequency	days/year	104	assumption	78	assumption	
	ED	Exposure Duration	years	6	USEPA, 1994b	2	USEPA, 1994b	
	DAF	Dermal Absorption Factor	--	chemical specific	--	chemical specific	--	
	BW	Body Weight	kg	15	USEPA, 1994b	15	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	730	USEPA, 1989		
CF	Conversion Factor	kg/mg	0.000001	--	0.000001	--		

TABLE 4.11
VALUES USED FOR DAILY INTAKE CALCULATIONS

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Fish Tissue
Exposure Point: Aberjona River Reaches
Receptor Population: Recreational User
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CF	Chemical Concentration in Fish	mg/kg	see Table 3.7	see Table 3.7	see Table 3.7	see Table 3.7	Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{CF \times IR \times EF \times ED \times FI \times CF1}{BW \times AT}$
	IR	Ingestion Rate of Fish	mg/day	6,700	USEPA, 1994b	6,700	USEPA, 1994b	
	EF	Exposure Frequency	days/year	365	USEPA, 1994b	365	USEPA, 1994b	
	ED	Exposure Duration	years	24	USEPA, 1994b	7	USEPA, 1994b	
	FI	Fraction Ingested From Site	--	1	assumption	0.5	assumption	
	BW	Body Weight	kg	70	USEPA, 1994b	70	USEPA, 1994b	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	USEPA, 1989	2,555	USEPA, 1989	
CF1	Conversion Factor	kg/mg	0.000001	--	0.000001	--		

TABLE 4.12
VALUES USED FOR DAILY INTAKE CALCULATIONS

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Fish Tissue
Exposure Point: Aberjona River Reaches
Receptor Population: Recreational User
Receptor Age: Older Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CF	Chemical Concentration in Fish	mg/kg	see Table 3.7	see Table 3.7	see Table 3.7	see Table 3.7	Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{CF \times IR \times EF \times ED \times FI \times CF1}{BW \times AT}$
	IR	Ingestion Rate of Fish	mg/day	3,350	assumption	3,350	assumption	
	EF	Exposure Frequency	days/year	365	USEPA, 1994b	365	USEPA, 1994b	
	ED	Exposure Duration	years	6	USEPA, 1994b	2	USEPA, 1994b	
	FI	Fraction Ingested From Site	--	1	assumption	0.5	assumption	
	BW	Body Weight	kg	31	USEPA, 1989	31	USEPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	USEPA, 1989	730	USEPA, 1989	
CF1	Conversion Factor	kg/mg	0.000001	--	0.000001	--		

TABLE 5
NON-CANCER TOXICITY DATA -- ORAL/DERMAL

INDUSTRI-PLEX SUPERFUND SITE

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (MM/DD/YY)
Benzo(a)anthracene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(a)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(b)fluoranthene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(k)fluoranthene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
bis(2-Ethylhexyl)phthalate	Chronic	2E-02	mg/kg-day	(4)	2.E-02	mg/kg-day	Liver	1000	IRIS	08/01/04
Dibenz(a,h)anthracene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Indeno(1,2,3-cd)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Phenanthrene ⁽³⁾	Chronic	2E-02	mg/kg-day	(4)	2.E-02	mg/kg-day	General Toxicity	3000	IRIS	08/01/04
4,4'-DDE	Chronic	3E-04	mg/kg-day	(4)	3E-04	mg/kg-day	Developmental	3000	NCEA	08/01/04
Aroclor 1248 ⁽³⁾	Chronic	2E-05	mg/kg-day	(4)	2E-05	mg/kg-day	Immune System	300	IRIS	08/01/04
Aroclor 1260 ⁽³⁾	Chronic	2E-05	mg/kg-day	(4)	2E-05	mg/kg-day	Immune System	300	IRIS	08/01/04
Antimony	Chronic	4E-04	mg/kg-day	0.15	6E-05	mg/kg-day	Blood	1000	IRIS	08/01/04
Arsenic	Chronic	3E-04	mg/kg-day	(4)	3E-04	mg/kg-day	Skin	3	IRIS	08/01/04
Cadmium (food)	Chronic	1E-03	mg/kg-day	0.010	1.0E-05	mg/kg-day	Kidney	10	IRIS	08/01/04
Chromium VI	Chronic	3E-03	mg/kg-day	0.013	3.9E-05	mg/kg-day	Gastrointestinal System	300	IRIS	08/01/04
Copper	Chronic	3E-02	mg/kg-day	(4)	3E-02	mg/kg-day	Kidney	1000	NCEA	08/01/04
Lead ⁽⁶⁾										
Manganese	Chronic	7E-02	mg/kg-day	0.04	2.8E-03	mg/kg-day	Nervous System	1	IRIS	08/01/04
Mercury (inorganic)	Chronic	3E-04	mg/kg-day	0.07	2.1E-05	mg/kg-day	Immune System	1000	IRIS	08/01/04
Mercury (organic)	Chronic	1E-04	mg/kg-day	(4)	1E-04	mg/kg-day	Nervous System	10	IRIS	08/01/04
Selenium	Chronic	5E-03	mg/kg-day	(4)	5E-03	mg/kg-day	Liver	3	IRIS	08/01/04
Vanadium	Chronic	1E-03	mg/kg-day	0.026	2.6E-05	mg/kg-day	Kidney	300	NCEA	08/01/04

(1) All oral absorption efficiencies from USEPA, 2001b, except copper (from ASTDR, 2002).

IRIS = Integrated Risk Information System

(2) Calculated as: (oral RfD) x (oral to dermal adjustment factor).

HEAST = Health Effects Assessment Summary Tables

(3) RfD for Aroclor 1254 used as a surrogate for Aroclor 1248 and Aroclor 1260.

N/A = Not Applicable

RfDs for manganese are based on total allowable intake (10 mg/day) minus the background intake (5 mg/day). The remaining intake (5 mg/day) is divided by 70 kg.

NCEA = National Center for Environmental Assessment

RfD for naphthalene used as a surrogate for phenanthrene.

RfD for chromium is based on Chromium VI.

RfD for mercury (inorganic) based on mercuric chloride; for mercury (organic), based on methylmercury.

(4) Oral absorption efficiency exceeds 50%. Therefore, no adjustment of the oral reference dose is necessary.

(5) Permeability constants (Kp) used for surface water absorption calculations: 1E-03 cm/hr for arsenic, manganese, and mercury (USEPA, 2001b); for organics, see Appendix C.7.

(6) Retained for comparison purposes.

TABLE 6
CANCER TOXICITY DATA -- ORAL/DERMAL

INDUSTRI-PLEX SUPERFUND SITE

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence Category	Source	Date (MM/DD/YY)
Benzo(a)anthracene	7.3E-01	(1)	7.3E-01	(mg/kg-day) ⁻¹	B2	IRIS	08/01/04
Benzo(a)pyrene	7.3E+00	(1)	7.3E+00	(mg/kg-day) ⁻¹	B2	IRIS	08/01/04
Benzo(b)fluoranthene	7.3E-01	(1)	7.3E-01	(mg/kg-day) ⁻¹	B2	IRIS	08/01/04
Benzo(k)fluoranthene	7.3E-02	(1)	7.3E-02	(mg/kg-day) ⁻¹	B2	IRIS	08/01/04
bis(2-Ethylhexyl)phthalate	1.4E-02	(1)	1.4E-02	(mg/kg-day) ⁻¹	B2	IRIS	08/01/04
Dibenz(a,h)anthracene	7.3E+00	(1)	7.3E+00	(mg/kg-day) ⁻¹	B2	IRIS	08/01/04
Indeno(1,2,3-cd)pyrene	7.3E-01	(1)	7.3E-01	(mg/kg-day) ⁻¹	B2	IRIS	08/01/04
Phenanthrene	N/A	N/A	N/A	N/A	D	IRIS	08/01/04
4,4'-DDE	3.4E-01	(1)	3.4E-01	(mg/kg-day) ⁻¹	B2	IRIS	08/01/04
Aroclor 1248	2.0E+00	(1)	2.0E+00	(mg/kg-day) ⁻¹	B2	IRIS	08/01/04
Aroclor 1260	2.0E+00	(1)	2.0E+00	(mg/kg-day) ⁻¹	B2	IRIS	08/01/04
Antimony	N/A	N/A	N/A	N/A	D	IRIS	08/01/04
Arsenic	1.5E+00	(1)	1.5E+00	(mg/kg-day) ⁻¹	A	IRIS	08/01/04
Cadmium	N/A	N/A	N/A	N/A	D	IRIS	08/01/04
Chromium VI	N/A	N/A	N/A	N/A	D	IRIS	08/01/04
Copper	N/A	N/A	N/A	N/A	D	IRIS	08/01/04
Lead ⁽³⁾							
Manganese	N/A	N/A	N/A	N/A	D	IRIS	08/01/04
Mercury (inorganic)	N/A	N/A	N/A	N/A	C	IRIS	08/01/04
Mercury (organic)	N/A	N/A	N/A	N/A	C	IRIS	08/01/04
Selenium	N/A	N/A	N/A	N/A	D	IRIS	08/01/04
Vanadium	N/A	N/A	N/A	N/A	D	IRIS	08/01/04

IRIS = Integrated Risk Information System

EPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen (by the oral route)

E - Evidence of noncarcinogenicity

RME = Reasonable Maximum Exposure

CT = Central Tendency

N/A = Not Applicable

Slope factor for benzo(a)pyrene, along with the appropriate relative potency factor (USEPA, 1993), used for the other carcinogenic PAHs.

For PCBs, the RME slope factor is presented. A slope factor of 1 (mg/kg-day)⁻¹ is used for CT risk estimates.

Weight of evidence for mercury (inorganic) based on mercuric chloride; for mercury (organic), based on methylmercury.

(1) Oral absorption efficiency exceeds 50%. Therefore, no adjustment of the oral slope factor is necessary.

(2) Calculated as: (oral slope factor) / (oral to dermal adjustment factor)

(3) Retained for comparison purposes.

TABLE 7.1.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: River/Stream
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	1.6E+01	Wg/L	1.6E+01	Wg/L	M	9.1E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	3.0E-04
	Lead												
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	8.1E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	2.9E-03
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	5.7E-10	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	2.7E-05
	(Total)												3.2E-03
Total Hazard Index Across All Exposure Routes/Pathways													3E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.1.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: River/Stream
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	4.5E+00	Wg/L	4.5E+00	Wg/L	M	1.3E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	4.3E-05
	Lead												
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	4.0E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	1.4E-03
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	2.9E-10	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	1.4E-05
	(Total)												1.5E-03
Total Hazard Index Across All Exposure Routes/Pathways													2E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.2.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: River/Stream
 Receptor Population: 1-Day Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	1.6E+01	Wg/L	1.6E+01	Wg/L	M	2.1E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	7.0E-04
	Lead												
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	1.9E-05	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	6.6E-03
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	1.3E-09	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	6.3E-05
	(Total)												7.4E-03
Total Hazard Index Across All Exposure Routes/Pathways													7E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.2.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: River/Stream
 Receptor Population: 1-Day Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	4.5E+00	Wg/L	4.5E+00	Wg/L	M	3.0E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	9.9E-05
	Lead												
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	9.3E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	3.3E-03
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	6.6E-10	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	3.1E-05
	(Total)												3.4E-03
Total Hazard Index Across All Exposure Routes/Pathways													3E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.3.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: River/Stream
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	1.6E+01	Wg/L	1.6E+01	Wg/L	M	3.6E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.2E-03
	Lead												
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	3.2E-05	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	1.2E-02
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	2.3E-09	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	1.1E-04
	(Total)												1.3E-02
Total Hazard Index Across All Exposure Routes/Pathways													1E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.3.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: River/Stream
 Receptor Population: 4-Day Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	4.5E+00	Wg/L	4.5E+00	Wg/L	M	3.9E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.3E-04
	Lead												
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	1.2E-05	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	4.3E-03
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	8.6E-10	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	4.1E-05
	(Total)												4.5E-03
Total Hazard Index Across All Exposure Routes/Pathways													5E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.4.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: River/Stream
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	1.6E+01	Wg/L	1.6E+01	Wg/L	M	8.4E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.8E-03
	Lead												
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	7.4E-05	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	2.7E-02
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	5.3E-09	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	2.5E-04
	(Total)												3.0E-02
Total Hazard Index Across All Exposure Routes/Pathways													3E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.4.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: River/Stream
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	4.5E+00	Wg/L	4.5E+00	Wg/L	M	8.9E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	3.0E-04
	Lead												
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	2.8E-05	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	9.9E-03
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	2.0E-09	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	9.4E-05
	(Total)												1.0E-02
Total Hazard Index Across All Exposure Routes/Pathways													1E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.5.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Wetland
 Receptor Population: 1-Day Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	1.9E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	6.2E-05
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	3.0E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	1.1E-03
	Lead												
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	7.5E-10	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	3.6E-05
	(Total)												1.2E-03
Total Hazard Index Across All Exposure Routes/Pathways													1E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.5.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Wetland
 Receptor Population: 1-Day Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	9.3E-09	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	3.1E-05
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	1.5E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	5.4E-04
	Lead												
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	3.8E-10	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	1.8E-05
	(Total)												5.9E-04
Total Hazard Index Across All Exposure Routes/Pathways													6E-04

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.6.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Wetland
 Receptor Population: 1-Day Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	4.3E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.4E-04
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	6.9E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	2.5E-03
	Lead												
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	1.7E-09	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	8.2E-05
	(Total)												2.7E-03
Total Hazard Index Across All Exposure Routes/Pathways													3E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.6.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Wetland
 Receptor Population: 1-Day Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	2.1E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	7.1E-05
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	3.5E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	1.2E-03
	Lead												
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	8.6E-10	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	4.1E-05
	(Total)												1.3E-03
Total Hazard Index Across All Exposure Routes/Pathways													1E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.7.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Wetland
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	7.4E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.5E-04
	Lead												
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	1.2E-05	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	4.3E-03
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	3.0E-09	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	1.4E-04
	(Total)												4.7E-03
Total Hazard Index Across All Exposure Routes/Pathways													5E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.7.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Wetland
 Receptor Population: 4-Day Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	2.8E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	9.3E-05
	Lead												
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	4.5E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	1.6E-03
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	1.1E-09	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	5.4E-05
	(Total)												1.8E-03
Total Hazard Index Across All Exposure Routes/Pathways													2E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.8.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Wetland
 Receptor Population: 4-Day Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	1.7E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	5.7E-04
	Lead												
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	2.8E-05	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	9.9E-03
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	6.9E-09	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	3.3E-04
	(Total)												1.1E-02
Total Hazard Index Across All Exposure Routes/Pathways													1E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.8.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Wetland
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	6.4E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.1E-04
	Lead												
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	1.0E-05	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	3.7E-03
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	2.6E-09	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	1.2E-04
	(Total)												4.0E-03
Total Hazard Index Across All Exposure Routes/Pathways													4E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.9.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	bis(2-Ethylhexyl)	2.8E+00	Wg/L	2.8E+00	Wg/L	M	2.2E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.1E-05
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	2.1E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	7.0E-04
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	2.9E-05	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	4.1E-04
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	8.8E-09	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.9E-05
	Mercury	1.2E-01	Wg/L	1.2E-01	Wg/L	M	8.8E-09	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.2E-03
	(Total)												1.2E-03
Dermal	bis(2-Ethylhexyl)	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.9E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	9.7E-05
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	7.6E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.5E-04
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	1.0E-05	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	3.7E-03
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	3.2E-09	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	1.5E-04
	Mercury	1.2E-01	Wg/L	1.2E-01	Wg/L	M	3.2E-09	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	4.2E-03
	(Total)												4.2E-03
Total Hazard Index Across All Exposure Routes/Pathways													5E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.9.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	bis(2-Ethylhexyl)	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.4E-08	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	6.9E-07
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.3E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	4.5E-05
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	1.8E-06	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	2.6E-05
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	2.1E-10	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	7.0E-07
	Mercury	4.3E-02	Wg/L	4.3E-02	Wg/L	M	2.1E-10	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	7.3E-05
	(Total)												
Dermal	bis(2-Ethylhexyl)	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.2E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	6.2E-06
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	4.9E-09	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.6E-05
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	6.6E-07	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	2.4E-04
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	7.6E-11	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	3.6E-06
	Mercury	4.3E-02	Wg/L	4.3E-02	Wg/L	M	7.6E-11	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	2.6E-04
	(Total)												
Total Hazard Index Across All Exposure Routes/Pathways													3E-04

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.10.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Pond/Lake
 Receptor Population: Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	bis(2-Ethylhexyl)	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.0E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	5.1E-05
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	9.8E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	3.3E-03
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	1.3E-04	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	1.9E-03
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	4.1E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.4E-04
	(Total)												5.4E-03
Dermal	bis(2-Ethylhexyl)	2.8E+00	Wg/L	2.8E+00	Wg/L	M	3.3E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.7E-04
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.3E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	4.3E-04
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	1.8E-05	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	6.3E-03
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	5.4E-09	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	2.6E-04
	(Total)												7.1E-03
Total Hazard Index Across All Exposure Routes/Pathways													1E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.10.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Pond/Lake
 Receptor Population: Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	bis(2-Ethylhexyl)	2.8E+00	Wg/L	2.8E+00	Wg/L	M	6.5E-08	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	3.2E-06
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	6.3E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.1E-04
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	8.6E-06	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	1.2E-04
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	9.8E-10	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	3.3E-06
	Mercury												3.4E-04
	(Total)												
Dermal	bis(2-Ethylhexyl)	2.8E+00	Wg/L	2.8E+00	Wg/L	M	2.1E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.1E-05
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	8.3E-09	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.8E-05
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	1.1E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	4.0E-04
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	1.3E-10	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	6.2E-06
	Mercury												4.5E-04
	(Total)												8E-04
Total Hazard Index Across All Exposure Routes/Pathways													8E-04

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.11.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Pond/Lake
 Receptor Population: 1-Day Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	4.1E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	2.1E-05
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.6E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	5.3E-05
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	2.2E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	7.8E-04
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	6.7E-10	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	3.2E-05
	Mercury												8.8E-04
	(Total)												9E-04
Total Hazard Index Across All Exposure Routes/Pathways													9E-04

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.11.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	2.1E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.0E-05
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	8.0E-09	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.7E-05
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	1.1E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	3.9E-04
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	1.2E-10	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	5.9E-06
	Mercury												4.3E-04
	(Total)												4.3E-04
Total Hazard Index Across All Exposure Routes/Pathways													4E-04

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.12.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Pond/Lake
 Receptor Population: 1-Day Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	9.4E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	4.7E-05
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	3.7E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.2E-04
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	5.0E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	1.8E-03
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	1.5E-09	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	7.3E-05
	Mercury												2.0E-03
	(Total)												2.0E-03
Total Hazard Index Across All Exposure Routes/Pathways													2E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.12.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	4.7E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	2.4E-05
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.8E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	6.1E-05
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	2.5E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	8.9E-04
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	2.9E-10	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	1.4E-05
	Mercury												9.9E-04
	(Total)												9.9E-04
Total Hazard Index Across All Exposure Routes/Pathways													1E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.13.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.6E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	8.2E-05
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	6.4E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.1E-04
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	8.7E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	3.1E-03
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	2.7E-09	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	1.3E-04
	Mercury												3.5E-03
	(Total)												4E-03
Total Hazard Index Across All Exposure Routes/Pathways													4E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.13.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	6.2E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	3.1E-05
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	2.4E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	8.0E-05
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	3.3E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	1.2E-03
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	3.7E-10	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	1.8E-05
	Mercury												1.3E-03
	(Total)												1.3E-03
Total Hazard Index Across All Exposure Routes/Pathways													1E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.14.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	3.8E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.9E-04
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.5E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	4.9E-04
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	2.0E-05	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	7.1E-03
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	6.1E-09	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	2.9E-04
	Mercury												8.1E-03
	(Total)												8E-03
Total Hazard Index Across All Exposure Routes/Pathways													8E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.14.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Pond/Lake
 Receptor Population: 4-Day Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.4E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	7.1E-05
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	5.5E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.8E-04
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	7.5E-06	mg/kg-day	2.8E-03	mg/kg-day	N/A	N/A	2.7E-03
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	8.6E-10	mg/kg-day	2.1E-05	mg/kg-day	N/A	N/A	4.1E-05
	Mercury												3.0E-03
	(Total)												3.0E-03
Total Hazard Index Across All Exposure Routes/Pathways													3E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.15.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	6.6E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	7.2E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	9.2E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	8.2E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	1.4E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	5.7E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	8.5E-08	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	4.2E-06
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	1.3E-07	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	3.1E-04
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	1.3E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	4.5E-03
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	2.3E-07	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	2.3E-04
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	1.8E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	6.0E-03
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	1.1E-05	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	3.8E-04
	Lead												
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	7.0E-05	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	1.0E-03
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	2.5E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	8.2E-05
Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	1.7E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	1.7E-03	
	(Total)												1.4E-02
Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	6.8E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	7.4E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	9.5E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	8.5E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	1.5E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	5.9E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	8.8E-08	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	4.4E-06
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	3.2E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.1E-03
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	1.9E-08	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	1.9E-03
		(Total)											
Total Hazard Index Across All Exposure Routes/Pathways													2E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.15.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	3.3E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	3.6E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	4.6E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	4.1E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	7.2E-09	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	2.8E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	4.2E-08	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	2.1E-06
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	6.3E-08	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	1.6E-04
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	6.7E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.2E-03
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	1.2E-07	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	1.2E-04
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	9.0E-06	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	3.0E-03
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	5.7E-06	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	1.9E-04
	Lead												
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	3.5E-05	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	5.0E-04
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	1.2E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	4.1E-05
	Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	8.7E-07	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	8.7E-04
		(Total)											
Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	6.8E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	7.4E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	9.5E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	8.5E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	1.5E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	5.9E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	8.8E-08	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	4.4E-06
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	3.2E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.1E-03
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	1.9E-08	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	1.9E-03
		(Total)											
Total Hazard Index Across All Exposure Routes/Pathways													1E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.16.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	6.2E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	6.7E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	8.6E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	7.7E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	1.3E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	5.3E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	7.9E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	4.0E-05
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	1.2E-06	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	2.9E-03
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	1.3E-05	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	4.2E-02
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	2.2E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	2.2E-03
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	1.7E-04	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	5.6E-02
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	1.1E-04	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	3.6E-03
	Lead												
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	6.5E-04	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	9.3E-03
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	2.3E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	7.7E-04
Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	1.6E-05	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	1.6E-02	
	(Total)												1.3E-01
Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	6.7E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	7.3E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	9.4E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	8.4E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	1.5E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	5.8E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	8.6E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	4.3E-05
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	3.2E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.1E-02
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	1.8E-07	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	1.8E-02
		(Total)											
Total Hazard Index Across All Exposure Routes/Pathways													2E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.16.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient	
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	3.1E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	3.3E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	4.3E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	3.8E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	6.7E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	2.6E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	4.0E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	2.0E-05	
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	5.9E-07	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	1.5E-03	
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	6.3E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.1E-02	
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	1.1E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	1.1E-03	
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	8.4E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	2.8E-02	
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	5.3E-05	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	1.8E-03	
	Lead													
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	3.3E-04	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	4.7E-03	
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	1.1E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	3.8E-04	
	Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	8.1E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	8.1E-03	
		(Total)												6.6E-02
	Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	6.7E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
Benzo(a)pyrene		1.4E+00	mg/kg	1.4E+00	mg/kg	M	7.3E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
Benzo(b)fluoranthene		1.8E+00	mg/kg	1.8E+00	mg/kg	M	9.4E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
Benzo(k)fluoranthene		1.6E+00	mg/kg	1.6E+00	mg/kg	M	8.4E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
Dibenz(a,h)anthracene		2.8E-01	mg/kg	2.8E-01	mg/kg	M	1.5E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
Indeno(1,2,3-cd)pyrene		1.1E+00	mg/kg	1.1E+00	mg/kg	M	5.8E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
Phenanthrene		1.7E+00	mg/kg	1.7E+00	mg/kg	M	8.6E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	4.3E-05	
Arsenic		2.6E+01	mg/kg	2.6E+01	mg/kg	M	3.2E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.1E-02	
Cadmium		4.6E+00	mg/kg	4.6E+00	mg/kg	M	1.8E-07	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	1.8E-02	
		(Total)												2.9E-02
Total Hazard Index Across All Exposure Routes/Pathways													1E-01	

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.17.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	2.6E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.9E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	3.7E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	3.3E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	5.8E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	2.3E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	3.4E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.7E-05
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	5.0E-07	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	1.3E-03
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	5.4E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.8E-02
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	9.3E-07	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	9.3E-04
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	7.2E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	2.4E-02
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	4.6E-05	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	1.5E-03
	Lead												
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	2.8E-04	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	4.0E-03
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	9.8E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	3.3E-04
Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	7.0E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	7.0E-03	
	(Total)												5.7E-02
Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	2.7E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	3.0E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	3.8E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	3.4E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	6.0E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	2.3E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	3.5E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.8E-05
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	1.3E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	4.3E-03
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	7.4E-08	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	7.4E-03
		(Total)											
Total Hazard Index Across All Exposure Routes/Pathways													7E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.17.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient	
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	9.9E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	1.1E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	1.4E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	1.2E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	2.2E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	8.5E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	1.3E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	6.3E-06	
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	1.9E-07	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	4.7E-04	
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	2.0E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	6.7E-03	
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	3.5E-07	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	3.5E-04	
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	2.7E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	9.0E-03	
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	1.7E-05	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	5.7E-04	
	Lead													
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	1.0E-04	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	1.5E-03	
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	3.7E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.2E-04	
	Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	2.6E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	2.6E-03	
		(Total)												2.1E-02
	Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	2.1E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
Benzo(a)pyrene		1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.2E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
Benzo(b)fluoranthene		1.8E+00	mg/kg	1.8E+00	mg/kg	M	2.9E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
Benzo(k)fluoranthene		1.6E+00	mg/kg	1.6E+00	mg/kg	M	2.6E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
Dibenz(a,h)anthracene		2.8E-01	mg/kg	2.8E-01	mg/kg	M	4.5E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
Indeno(1,2,3-cd)pyrene		1.1E+00	mg/kg	1.1E+00	mg/kg	M	1.8E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
Phenanthrene		1.7E+00	mg/kg	1.7E+00	mg/kg	M	2.6E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.3E-05	
Arsenic		2.6E+01	mg/kg	2.6E+01	mg/kg	M	9.7E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	3.2E-03	
Cadmium		4.6E+00	mg/kg	4.6E+00	mg/kg	M	5.6E-08	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	5.6E-03	
		(Total)												8.8E-03
Total Hazard Index Across All Exposure Routes/Pathways													3E-02	

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.18.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	2.5E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.7E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	3.4E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	3.1E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	5.4E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	2.1E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	3.2E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.6E-04
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	4.7E-06	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	1.2E-02
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	5.0E-05	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.7E-01
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	8.7E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	8.7E-03
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	6.7E-04	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	2.2E-01
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	4.3E-04	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	1.4E-02
	Lead												
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	2.6E-03	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	3.7E-02
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	9.2E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	3.1E-03
	Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	6.5E-05	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	6.5E-02
	(Total)												5.3E-01
Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	2.7E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.9E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	3.7E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	3.3E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	5.9E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	2.3E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	3.5E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.7E-04
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	1.3E-05	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	4.2E-02
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	7.3E-07	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	7.3E-02
		(Total)											
Total Hazard Index Across All Exposure Routes/Pathways													6E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.18.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	9.2E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	1.0E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	1.3E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	1.1E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	2.0E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	7.9E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	1.2E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	5.9E-05
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	1.8E-06	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	4.4E-03
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	1.9E-05	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	6.3E-02
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	3.3E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	3.3E-03
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	2.5E-04	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	8.4E-02
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	1.6E-04	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	5.3E-03
	Lead												
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	9.8E-04	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	1.4E-02
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	3.4E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.1E-03
	Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	2.4E-05	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	2.4E-02
		(Total)											
Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	2.0E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.2E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	2.8E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	2.5E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	4.4E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	1.7E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	2.6E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.3E-04
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	9.5E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	3.2E-02
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	5.5E-07	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	5.5E-02
		(Total)											
Total Hazard Index Across All Exposure Routes/Pathways													3E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.19.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	2.8E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	2.5E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	4.8E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	4.8E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	1.8E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	7.1E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	6.1E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	3.1E-05
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	1.3E-08	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	6.6E-04
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	5.3E-08	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	1.3E-04
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	1.7E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	5.6E-03
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	1.1E-07	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	1.1E-04
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	2.1E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	7.0E-03
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	4.8E-06	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	1.6E-04
	Lead												
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	1.1E-05	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	1.5E-04
	Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	3.6E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.2E-04
	Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	5.0E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	5.0E-03
	(Total)												1.9E-02
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	2.9E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	2.6E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	4.9E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	5.0E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	1.8E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	7.4E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	6.3E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	3.2E-05
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	1.5E-08	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	7.4E-04
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	4.0E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.3E-03
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	8.8E-09	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	8.8E-04
		(Total)											
Total Hazard Index Across All Exposure Routes/Pathways													2E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
N/A = Not Applicable
EPC = Exposure Point Concentration
Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.19.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	1.4E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	1.2E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	2.4E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	2.4E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	8.9E-09	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	3.6E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	3.1E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.5E-05
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	6.6E-09	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	3.3E-04
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	2.7E-08	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	6.7E-05
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	8.3E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.8E-03
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	5.5E-08	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	5.5E-05
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	1.0E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	3.5E-03
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	2.4E-06	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	7.9E-05
	Lead												
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	5.3E-06	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	7.6E-05
	Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	1.8E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	6.0E-05
Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	2.5E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	2.5E-03	
	(Total)												9.5E-03
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	2.9E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	2.6E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	4.9E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	5.0E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	1.8E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	7.4E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	6.3E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	3.2E-05
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	1.5E-08	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	7.4E-04
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	4.0E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.3E-03
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	8.8E-09	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	8.8E-04
	(Total)												3.0E-03
Total Hazard Index Across All Exposure Routes/Pathways													1E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
N/A = Not Applicable
EPC = Exposure Point Concentration
Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.20.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	2.6E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	2.3E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	4.4E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	4.5E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	1.7E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	6.7E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	5.7E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	2.8E-04
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	1.2E-07	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	6.2E-03
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	5.0E-07	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	1.2E-03
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	1.6E-05	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	5.2E-02
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	1.0E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	1.0E-03
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	1.9E-04	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	6.5E-02
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	4.4E-05	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	1.5E-03
	Lead												
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	1.0E-04	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	1.4E-03
	Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	3.4E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.1E-03
	Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	4.7E-05	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	4.7E-02
	(Total)												1.8E-01
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	2.8E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	2.5E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	4.9E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	4.9E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	1.8E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	7.3E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	6.2E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	3.1E-04
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	1.5E-07	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	7.3E-03
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	3.9E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.3E-02
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	8.6E-08	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	8.6E-03
		(Total)											
Total Hazard Index Across All Exposure Routes/Pathways													2E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.
N/A = Not Applicable
EPC = Exposure Point Concentration
Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.20.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	1.3E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	1.2E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	2.2E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	2.2E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	8.3E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	3.3E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	2.8E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.4E-04
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	6.2E-08	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	3.1E-03
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	2.5E-07	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	6.2E-04
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	7.8E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.6E-02
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	5.1E-07	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	5.1E-04
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	9.7E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	3.2E-02
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	2.2E-05	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	7.4E-04
	Lead												
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	5.0E-05	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	7.1E-04
	Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	1.7E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	5.6E-04
Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	2.3E-05	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	2.3E-02	
	(Total)												8.8E-02
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	2.8E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	2.5E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	4.9E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	4.9E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	1.8E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	7.3E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	6.2E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	3.1E-04
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	1.5E-07	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	7.3E-03
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	3.9E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.3E-02
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	8.6E-08	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	8.6E-03
	(Total)												2.9E-02
Total Hazard Index Across All Exposure Routes/Pathways													1E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.
N/A = Not Applicable
EPC = Exposure Point Concentration
Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.21.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	1.1E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	1.0E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	1.9E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	1.9E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	7.1E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.9E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	2.4E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.2E-04
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	5.3E-08	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	2.7E-03
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	2.1E-07	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	5.3E-04
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	6.7E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.2E-02
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	4.4E-07	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	4.4E-04
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	8.3E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	2.8E-02
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	1.9E-05	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	6.3E-04
	Lead												
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	4.3E-05	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	6.1E-04
	Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	1.4E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	4.8E-04
	Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	2.0E-05	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	2.0E-02
	(Total)												7.6E-02
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	1.1E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	1.0E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	2.0E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	2.0E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	7.4E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	3.0E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	2.5E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.3E-04
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	5.9E-08	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	3.0E-03
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	1.6E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	5.3E-03
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	3.5E-08	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	3.5E-03
		(Total)											
Total Hazard Index Across All Exposure Routes/Pathways													9E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
N/A = Not Applicable
EPC = Exposure Point Concentration
Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.21.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient	
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	4.1E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	3.7E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	7.1E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	7.2E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	2.7E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	1.1E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	9.2E-07	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	4.6E-05	
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	2.0E-08	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	1.0E-03	
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	8.0E-08	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	2.0E-04	
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	2.5E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	8.3E-03	
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	1.7E-07	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	1.7E-04	
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	3.1E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	1.0E-02	
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	7.1E-06	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	2.4E-04	
	Lead													
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	1.6E-05	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	2.3E-04	
	Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	5.4E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.8E-04	
Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	7.6E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	7.6E-03		
	(Total)												2.8E-02	
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	8.6E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	7.8E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	1.5E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	1.5E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	5.5E-08	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.2E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A	
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	1.9E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	9.5E-05	
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	4.5E-08	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	2.2E-03	
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	1.2E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	4.0E-03	
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	2.6E-08	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	2.6E-03	
		(Total)												8.9E-03
Total Hazard Index Across All Exposure Routes/Pathways													4E-02	

(1) Medium-Specific (M) EPC selected for hazard calculation.
N/A = Not Applicable
EPC = Exposure Point Concentration
Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.22.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	1.0E-05	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	9.3E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	1.8E-05	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	1.8E-05	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	6.6E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.7E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	2.3E-05	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.1E-03
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	5.0E-07	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	2.5E-02
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	2.0E-06	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	5.0E-03
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	6.2E-05	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.1E-01
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	4.1E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	4.1E-03
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	7.8E-04	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	2.6E-01
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	1.8E-04	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	5.9E-03
	Lead												
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	4.0E-04	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	5.7E-03
	Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	1.3E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	4.5E-03
	Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	1.9E-04	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	1.9E-01
	(Total)												7.1E-01
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	1.1E-05	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	1.0E-05	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	1.9E-05	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	2.0E-05	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	7.3E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.9E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	2.5E-05	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	1.2E-03
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	5.8E-07	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	2.9E-02
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	1.6E-05	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	5.2E-02
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	3.5E-07	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	3.5E-02
	(Total)												1.2E-01
Total Hazard Index Across All Exposure Routes/Pathways													8E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.
N/A = Not Applicable
EPC = Exposure Point Concentration
Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.22.CT
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	3.9E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	3.5E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	6.7E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	6.7E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	2.5E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	1.0E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	8.5E-06	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	4.3E-04
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	1.9E-07	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	9.3E-03
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	7.5E-07	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	1.9E-03
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	2.3E-05	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	7.8E-02
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	1.5E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	1.5E-03
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	2.9E-04	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	9.7E-02
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	6.7E-05	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	2.2E-03
	Lead												
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	1.5E-04	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	2.1E-03
Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	5.1E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.7E-03	
Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	7.0E-05	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	7.0E-02	
	(Total)												2.6E-01
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	8.4E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	7.6E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	1.5E-05	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	1.5E-05	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	5.4E-07	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.2E-06	mg/kg-day	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	1.9E-05	mg/kg-day	2.0E-02	mg/kg-day	N/A	N/A	9.3E-04
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	4.4E-07	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	2.2E-02
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	1.2E-05	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	3.9E-02
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	2.6E-07	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	2.6E-02
	(Total)												8.8E-02
Total Hazard Index Across All Exposure Routes/Pathways													4E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.
N/A = Not Applicable
EPC = Exposure Point Concentration
Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.23.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Sediment
 Exposure Medium: Sediment
 Exposure Point: Pond/Lake
 Receptor Population: 1-Day Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	7.1E-08	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	1.8E-04
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	1.5E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	5.1E-03
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	1.5E-07	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	1.5E-04
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	7.9E-06	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	2.6E-03
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	3.3E-06	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	1.1E-04
	Lead												
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	4.3E-05	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	6.1E-04
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	1.8E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	5.9E-05
	Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	2.6E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	2.6E-03
	(Total)												1.1E-02
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	3.6E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.2E-03
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	1.2E-08	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	1.2E-03
		(Total)											2.4E-03
Total Hazard Index Across All Exposure Routes/Pathways													1E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.23.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Sediment
 Exposure Medium: Sediment
 Exposure Point: Pond/Lake
 Receptor Population: 1-Day Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	3.6E-08	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	8.9E-05
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	7.6E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.5E-03
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	7.4E-08	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	7.4E-05
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	3.9E-06	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	1.3E-03
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	1.7E-06	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	5.6E-05
	Lead												
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	2.1E-05	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	3.0E-04
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	8.9E-09	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	3.0E-05
	Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	1.3E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	1.3E-03
	(Total)												5.7E-03
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	3.6E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.2E-03
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	1.2E-08	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	1.2E-03
		(Total)											2.4E-03
Total Hazard Index Across All Exposure Routes/Pathways													8E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.24.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Sediment
 Exposure Medium: Sediment
 Exposure Point: Pond/Lake
 Receptor Population: 1-Day Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	6.6E-07	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	1.7E-03
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	1.4E-05	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	4.7E-02
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	1.4E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	1.4E-03
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	7.4E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	2.5E-02
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	3.1E-05	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	1.0E-03
	Lead												
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	4.0E-04	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	5.7E-03
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	1.7E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	5.5E-04
	Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	2.4E-05	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	2.4E-02
	(Total)												1.1E-01
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	3.6E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.2E-02
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	1.2E-07	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	1.2E-02
		(Total)											2.3E-02
Total Hazard Index Across All Exposure Routes/Pathways													1E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.24.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Sediment
 Exposure Medium: Sediment
 Exposure Point: Pond/Lake
 Receptor Population: 1-Day Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	3.3E-07	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	8.3E-04
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	7.1E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.4E-02
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	6.9E-07	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	6.9E-04
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	3.7E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	1.2E-02
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	1.6E-05	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	5.2E-04
	Lead												
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	2.0E-04	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	2.8E-03
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	8.3E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.8E-04
	Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	1.2E-05	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	1.2E-02
	(Total)												5.3E-02
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	3.6E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.2E-02
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	1.2E-07	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	1.2E-02
		(Total)											2.3E-02
Total Hazard Index Across All Exposure Routes/Pathways													8E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.25.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Sediment
 Exposure Medium: Sediment
 Exposure Point: Pond/Lake
 Receptor Population: 4-Day Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.8E-07	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	7.1E-04
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	6.1E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.0E-02
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	5.9E-07	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	5.9E-04
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	3.2E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	1.1E-02
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	1.3E-05	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	4.5E-04
	Lead												
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	1.7E-04	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	2.4E-03
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	7.1E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.4E-04
	Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	1.0E-05	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	1.0E-02
	(Total)												4.6E-02
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	1.5E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	4.9E-03
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	4.7E-08	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	4.7E-03
		(Total)											9.6E-03
Total Hazard Index Across All Exposure Routes/Pathways													6E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.25.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Sediment
 Exposure Medium: Sediment
 Exposure Point: Pond/Lake
 Receptor Population: 4-Day Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	1.1E-07	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	2.7E-04
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	2.3E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	7.6E-03
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	2.2E-07	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	2.2E-04
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	1.2E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	3.9E-03
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	5.0E-06	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	1.7E-04
	Lead												
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	6.4E-05	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	9.1E-04
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	2.7E-08	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	8.9E-05
	Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	3.9E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	3.9E-03
	(Total)												1.7E-02
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	1.1E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	3.6E-03
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	3.5E-08	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	3.5E-03
		(Total)											7.2E-03
Total Hazard Index Across All Exposure Routes/Pathways													2E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.26.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Sediment
 Exposure Medium: Sediment
 Exposure Point: Pond/Lake
 Receptor Population: 4-Day Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.7E-06	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	6.6E-03
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	5.7E-05	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.9E-01
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	5.5E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	5.5E-03
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	2.9E-04	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	9.8E-02
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	1.2E-04	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	4.2E-03
	Lead												
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	1.6E-03	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	2.3E-02
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	6.6E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	2.2E-03
	Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	9.8E-05	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	9.8E-02
	(Total)												4.3E-01
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	1.4E-05	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	4.8E-02
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	4.6E-07	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	4.6E-02
		(Total)											9.4E-02
Total Hazard Index Across All Exposure Routes/Pathways													5E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.26.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Sediment
 Exposure Medium: Sediment
 Exposure Point: Pond/Lake
 Receptor Population: 4-Day Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	1.0E-06	mg/kg-day	4.0E-04	mg/kg-day	N/A	N/A	2.5E-03
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	2.1E-05	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	7.1E-02
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	2.1E-06	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	2.1E-03
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	1.1E-04	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	3.7E-02
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	4.7E-05	mg/kg-day	3.0E-02	mg/kg-day	N/A	N/A	1.6E-03
	Lead												
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	6.0E-04	mg/kg-day	7.0E-02	mg/kg-day	N/A	N/A	8.5E-03
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	2.5E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	8.3E-04
	Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	3.7E-05	mg/kg-day	1.0E-03	mg/kg-day	N/A	N/A	3.7E-02
	(Total)												1.6E-01
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	1.1E-05	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	3.6E-02
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	3.5E-07	mg/kg-day	1.0E-05	mg/kg-day	N/A	N/A	3.5E-02
		(Total)											7.0E-02
Total Hazard Index Across All Exposure Routes/Pathways													2E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.27.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Fish Tissue
 Exposure Point: Fillet, Reference Locations
 Receptor Population: Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	4,4'-DDE Aroclor-1260	1.4E-02	mg/kg	1.4E-02	mg/kg	M	1.4E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	N/A
		6.3E-02	mg/kg	6.3E-02	mg/kg	M	6.0E-06	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	3.0E-01
	Arsenic	4.8E-02	mg/kg	4.8E-02	mg/kg	M	4.6E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.5E-02
	Chromium	7.5E-01	mg/kg	7.5E-01	mg/kg	M	7.2E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	2.4E-02
	Mercury	4.1E-01	mg/kg	4.1E-01	mg/kg	M	3.9E-05	mg/kg-day	1.0E-04	mg/kg-day	N/A	N/A	3.9E-01
	Selenium	5.1E-01	mg/kg	5.1E-01	mg/kg	M	4.9E-05	mg/kg-day	5.0E-03	mg/kg-day	N/A	N/A	9.8E-03
	(Total)												7.4E-01
Total Hazard Index Across All Exposure Routes/Pathways													7E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.27.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Fish Tissue
 Exposure Point: Fillet, Reference Locations
 Receptor Population: Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	4,4'-DDE	1.4E-02	mg/kg	1.4E-02	mg/kg	M	6.9E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	N/A
	Aroclor-1260	6.3E-02	mg/kg	6.3E-02	mg/kg	M	3.0E-06	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	1.5E-01
	Arsenic	4.8E-02	mg/kg	4.8E-02	mg/kg	M	2.3E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	7.7E-03
	Chromium	7.5E-01	mg/kg	7.5E-01	mg/kg	M	3.6E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	1.2E-02
	Mercury	4.1E-01	mg/kg	4.1E-01	mg/kg	M	2.0E-05	mg/kg-day	1.0E-04	mg/kg-day	N/A	N/A	2.0E-01
	Selenium	5.1E-01	mg/kg	5.1E-01	mg/kg	M	2.4E-05	mg/kg-day	5.0E-03	mg/kg-day	N/A	N/A	4.9E-03
	(Total)												3.7E-01
Total Hazard Index Across All Exposure Routes/Pathways													4E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.28.RME
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Fish Tissue
 Exposure Point: Fillet, Reference Locations
 Receptor Population: Recreational User
 Receptor Age: Older Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	4,4'-DDE Aroclor-1260	1.4E-02	mg/kg	1.4E-02	mg/kg	M	1.6E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	N/A
		6.3E-02	mg/kg	6.3E-02	mg/kg	M	6.8E-06	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	3.4E-01
	Arsenic	4.8E-02	mg/kg	4.8E-02	mg/kg	M	5.2E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	1.7E-02
	Chromium	7.5E-01	mg/kg	7.5E-01	mg/kg	M	8.1E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	2.7E-02
	Mercury	4.1E-01	mg/kg	4.1E-01	mg/kg	M	4.4E-05	mg/kg-day	1.0E-04	mg/kg-day	N/A	N/A	4.4E-01
	Selenium	5.1E-01	mg/kg	5.1E-01	mg/kg	M	5.5E-05	mg/kg-day	5.0E-03	mg/kg-day	N/A	N/A	1.1E-02
	(Total)												8.4E-01
Total Hazard Index Across All Exposure Routes/Pathways													8E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 7.28.CT
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Fish Tissue
 Exposure Point: Fillet, Reference Locations
 Receptor Population: Recreational User
 Receptor Age: Older Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	4,4'-DDE	1.4E-02	mg/kg	1.4E-02	mg/kg	M	7.8E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	N/A
	Aroclor-1260	6.3E-02	mg/kg	6.3E-02	mg/kg	M	3.4E-06	mg/kg-day	2.0E-05	mg/kg-day	N/A	N/A	1.7E-01
	Arsenic	4.8E-02	mg/kg	4.8E-02	mg/kg	M	2.6E-06	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	8.7E-03
	Chromium	7.5E-01	mg/kg	7.5E-01	mg/kg	M	4.1E-05	mg/kg-day	3.0E-03	mg/kg-day	N/A	N/A	1.4E-02
	Mercury	4.1E-01	mg/kg	4.1E-01	mg/kg	M	2.2E-05	mg/kg-day	1.0E-04	mg/kg-day	N/A	N/A	2.2E-01
	Selenium	5.1E-01	mg/kg	5.1E-01	mg/kg	M	2.8E-05	mg/kg-day	5.0E-03	mg/kg-day	N/A	N/A	5.5E-03
	(Total)												4.2E-01
Total Hazard Index Across All Exposure Routes/Pathways													4E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Hazard Quotient = Non-Cancer Intake / Reference Dose

TABLE 8.1.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: River/Stream
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	1.6E+01	Wg/L	1.6E+01	Wg/L	M	3.1E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	4.7E-08
	Lead										
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	2.8E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	2.0E-10	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										4.7E-08
Total Risk Across All Exposure Routes/Pathways											5E-08

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.1.CT
 CALCULATION OF CANCER RISKS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: River/Stream
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	4.5E+00	Wg/L	4.5E+00	Wg/L	M	1.3E-09	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.9E-09
	Lead										
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	4.0E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	2.9E-11	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										1.9E-09
Total Risk Across All Exposure Routes/Pathways											2E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.2.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: River/Stream
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	1.6E+01	Wg/L	1.6E+01	Wg/L	M	1.8E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	2.7E-08
	Lead										
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	1.6E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	1.1E-10	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										2.7E-08
Total Risk Across All Exposure Routes/Pathways											3E-08

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.2.CT
 CALCULATION OF CANCER RISKS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: River/Stream
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	4.5E+00	Wg/L	4.5E+00	Wg/L	M	8.5E-10	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.3E-09
	Lead										
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	2.7E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	1.9E-11	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										1.3E-09
Total Risk Across All Exposure Routes/Pathways											1E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.3.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: River/Stream
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	1.6E+01	Wg/L	1.6E+01	Wg/L	M	1.2E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.9E-07
	Lead										
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	1.1E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	7.9E-10	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										1.9E-07
Total Risk Across All Exposure Routes/Pathways											2E-07

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.3.CT
 CALCULATION OF CANCER RISKS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: River/Stream
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	4.5E+00	Wg/L	4.5E+00	Wg/L	M	3.9E-09	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	5.8E-09
	Lead										
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	1.2E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	8.6E-11	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										5.8E-09
Total Risk Across All Exposure Routes/Pathways											6E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.4.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: River/Stream
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	1.6E+01	Wg/L	1.6E+01	Wg/L	M	7.2E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.1E-07
	Lead										
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	6.4E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	4.5E-10	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										1.1E-07
Total Risk Across All Exposure Routes/Pathways											1E-07

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.4.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: River/Stream
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	4.5E+00	Wg/L	4.5E+00	Wg/L	M	2.5E-09	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	3.8E-09
	Lead										
	Manganese	1.4E+03	Wg/L	1.4E+03	Wg/L	M	8.0E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	9.9E-02	Wg/L	9.9E-02	Wg/L	M	5.6E-11	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										3.8E-09
Total Risk Across All Exposure Routes/Pathways											4E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.5.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Wetland
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	6.4E-09	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	9.5E-09
	Lead										
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	1.0E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	2.6E-10	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										9.5E-09
Total Risk Across All Exposure Routes/Pathways											1E-08

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.5.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Wetland
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	9.3E-10	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.4E-09
	Lead										
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	1.5E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	3.8E-11	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										1.4E-09
Total Risk Across All Exposure Routes/Pathways											1E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.6.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Wetland
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	3.6E-09	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	5.5E-09
	Lead										
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	5.9E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	1.5E-10	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										5.5E-09
Total Risk Across All Exposure Routes/Pathways											5E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.6.CT
 CALCULATION OF CANCER RISKS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Wetland
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	6.1E-10	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	9.1E-10
	Lead										
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	9.9E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	2.5E-11	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										9.1E-10
Total Risk Across All Exposure Routes/Pathways											9E-10

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.7.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Wetland
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	2.5E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	3.8E-08
	Lead										
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	4.1E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	1.0E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										3.8E-08
Total Risk Across All Exposure Routes/Pathways											4E-08

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.7.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Wetland
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	2.8E-09	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	4.2E-09
	Lead										
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	4.5E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	1.1E-10	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										4.2E-09
Total Risk Across All Exposure Routes/Pathways											4E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.8.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Wetland
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	1.5E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	2.2E-08
	Lead										
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	2.4E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	5.9E-10	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										2.2E-08
Total Risk Across All Exposure Routes/Pathways											2E-08

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.8.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Wetland
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Arsenic	3.2E+00	Wg/L	3.2E+00	Wg/L	M	1.8E-09	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	2.7E-09
	Lead										
	Manganese	5.2E+02	Wg/L	5.2E+02	Wg/L	M	3.0E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	1.3E-01	Wg/L	1.3E-01	Wg/L	M	7.4E-11	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										2.7E-09
Total Risk Across All Exposure Routes/Pathways											3E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.9.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	7.4E-08	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	1.0E-09
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	7.2E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.1E-07
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	9.8E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	3.0E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										
	(Total)										1.1E-07
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	6.7E-07	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	9.4E-09
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	2.6E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	3.9E-08
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	3.5E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	1.1E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										
	(Total)										4.8E-08
Total Risk Across All Exposure Routes/Pathways											2E-07

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.9.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.4E-09	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	1.9E-11
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.3E-09	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	2.0E-09
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	1.8E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	2.1E-11	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										
	(Total)										2.0E-09
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.2E-08	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	1.7E-10
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	4.9E-10	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	7.3E-10
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	6.6E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	7.6E-12	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										
	(Total)										9.0E-10
Total Risk Across All Exposure Routes/Pathways											3E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.10.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	8.7E-08	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	1.2E-09
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	8.4E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.3E-07
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	1.1E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	3.5E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										
	(Total)										1.3E-07
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	2.9E-07	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	4.0E-09
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.1E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.7E-08
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	1.5E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	4.6E-10	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										
	(Total)										2.1E-08
Total Risk Across All Exposure Routes/Pathways											1E-07

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.10.CT
 CALCULATION OF CANCER RISKS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Pond/Lake
 Receptor Population: Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.9E-09	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	2.6E-11
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.8E-09	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	2.7E-09
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	2.4E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	2.8E-11	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										
	(Total)										2.7E-09
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	6.1E-09	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	8.6E-11
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	2.4E-10	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	3.6E-10
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	3.2E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	3.7E-12	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										
	(Total)										4.4E-10
Total Risk Across All Exposure Routes/Pathways											3E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.11.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.4E-07	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	2.0E-09
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	5.5E-09	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	8.2E-09
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	7.5E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	2.3E-10	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										
	(Total)										1.0E-08
Total Risk Across All Exposure Routes/Pathways											1E-08

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.11.CT
 CALCULATION OF CANCER RISKS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	2.1E-08	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	2.9E-10
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	8.0E-10	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.2E-09
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	1.1E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	1.2E-11	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										
	(Total)										1.5E-09
Total Risk Across All Exposure Routes/Pathways											1E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.12.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	8.1E-08	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	1.1E-09
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	3.1E-09	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	4.7E-09
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	4.3E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	1.3E-10	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										
	(Total)										5.8E-09
Total Risk Across All Exposure Routes/Pathways											6E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.12.CT
 CALCULATION OF CANCER RISKS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.3E-08	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	1.9E-10
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	5.2E-10	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	7.9E-10
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	7.1E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	8.2E-12	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										
	(Total)										9.7E-10
Total Risk Across All Exposure Routes/Pathways											1E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.13.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Surface Water
 Exposure Point: Pond/Lake
 Receptor Population: 4-Day Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	5.6E-07	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	7.9E-09
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	2.2E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	3.3E-08
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	3.0E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	9.1E-10	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										
	(Total)										4.1E-08
Total Risk Across All Exposure Routes/Pathways											4E-08

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.13.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	6.2E-08	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	8.6E-10
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	2.4E-09	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	3.6E-09
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	3.3E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	3.7E-11	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										
	(Total)										4.5E-09
Total Risk Across All Exposure Routes/Pathways											4E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.14.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	3.2E-07	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	4.5E-09
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.3E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.9E-08
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	1.7E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	1.2E-01	Wg/L	1.2E-01	Wg/L	M	5.2E-10	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										
	(Total)										2.3E-08
Total Risk Across All Exposure Routes/Pathways											2E-08

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.14.CT
 CALCULATION OF CANCER RISKS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Pond/Lake
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	bis(2-Ethylhexyl)phtha	2.8E+00	Wg/L	2.8E+00	Wg/L	M	4.0E-08	mg/kg-day	1.4E-02	(mg/kg-day) ⁻¹	5.7E-10
	Arsenic	2.8E+00	Wg/L	2.8E+00	Wg/L	M	1.6E-09	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	2.4E-09
	Lead	3.7E+02	Wg/L	3.7E+02	Wg/L	M	2.1E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Manganese	4.3E-02	Wg/L	4.3E-02	Wg/L	M	2.5E-11	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury										2.9E-09
	(Total)										2.9E-09
Total Risk Across All Exposure Routes/Pathways											3E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

- - Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.15.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	2.3E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.7E-08
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.5E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.8E-07
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	3.2E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.3E-08
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	2.8E-08	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	2.1E-09
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	4.9E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	3.6E-08
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	1.9E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.4E-08
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	2.9E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	4.3E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	4.6E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	6.9E-07
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	8.0E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	6.2E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	3.9E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	2.4E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	8.4E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	6.0E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
		(Total)									
Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	2.3E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.7E-08
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.6E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.9E-07
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	3.3E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.4E-08
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	2.9E-08	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	2.1E-09
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	5.1E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	3.7E-08
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	2.0E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.5E-08
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	3.0E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	1.1E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.7E-07
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	6.4E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										4.5E-07
Total Risk Across All Exposure Routes/Pathways											1E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.
N/A = Not Applicable
EPC = Exposure Point Concentration
Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.15.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	3.3E-09	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.4E-09
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	3.6E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	2.6E-08
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	4.6E-09	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	3.4E-09
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	4.1E-09	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	3.0E-10
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	7.2E-10	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	5.3E-09
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	2.8E-09	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.1E-09
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	4.2E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	6.3E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	6.7E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.0E-07
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	1.2E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	9.0E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	5.7E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	3.5E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	1.2E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	8.7E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										1.4E-07
Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	6.8E-09	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	5.0E-09
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	7.4E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	5.4E-08
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	9.5E-09	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	7.0E-09
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	8.5E-09	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	6.2E-10
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	1.5E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.1E-08
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	5.9E-09	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	4.3E-09
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	8.8E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	3.2E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	4.8E-08
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	1.9E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
		(Total)									
Total Risk Across All Exposure Routes/Pathways											3E-07

(1) Medium-Specific (M) EPC selected for hazard calculation.
N/A = Not Applicable
EPC = Exposure Point Concentration
Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.16.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	5.3E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	3.9E-08
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	5.7E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	4.2E-07
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	7.4E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	5.4E-08
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	6.6E-08	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	4.8E-09
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	1.2E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	8.4E-08
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	4.5E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	3.3E-08
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	6.8E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	1.0E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	1.1E-06	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.6E-06
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	1.9E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	1.4E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	9.1E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	5.6E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	2.0E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	1.4E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										2.2E-06
Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	5.8E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	4.2E-08
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	6.3E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	4.6E-07
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	8.0E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	5.9E-08
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	7.2E-08	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	5.2E-09
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	1.3E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	9.2E-08
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	4.9E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	3.6E-08
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	7.4E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	2.7E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	4.1E-07
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	1.6E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
		(Total)									
Total Risk Across All Exposure Routes/Pathways											3E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.
N/A = Not Applicable
EPC = Exposure Point Concentration
Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.16.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	8.8E-09	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	6.4E-09
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	9.6E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	7.0E-08
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	1.2E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	8.9E-09
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	1.1E-08	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	8.0E-10
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	1.9E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.4E-08
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	7.5E-09	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	5.5E-09
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	1.1E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	1.7E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	1.8E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	2.7E-07
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	3.1E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	2.4E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	1.5E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	9.3E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	3.3E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	2.3E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
		(Total)									
Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	1.9E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.4E-08
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.1E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.5E-07
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	2.7E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.0E-08
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	2.4E-08	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	1.7E-09
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	4.2E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	3.1E-08
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	1.6E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.2E-08
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	2.5E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	9.0E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.4E-07
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	5.2E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
		(Total)									
Total Risk Across All Exposure Routes/Pathways											7E-07

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.17.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	9.0E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	6.6E-08
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	9.8E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	7.2E-07
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	1.3E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	9.2E-08
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	1.1E-07	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	8.2E-09
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	2.0E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.4E-07
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	7.8E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	5.7E-08
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	1.2E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	1.7E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	1.8E-06	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	2.8E-06
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	3.2E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	2.5E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	1.6E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	9.6E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	3.4E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	2.4E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
		(Total)									
Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	9.4E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	6.9E-08
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	1.0E-07	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	7.4E-07
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	1.3E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	9.5E-08
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	1.2E-07	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	8.5E-09
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	2.1E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.5E-07
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	8.0E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	5.9E-08
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	1.2E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	4.4E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	6.6E-07
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	2.5E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
		(Total)									
Total Risk Across All Exposure Routes/Pathways											6E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.
N/A = Not Applicable
EPC = Exposure Point Concentration
Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.17.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	9.9E-09	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	7.2E-09
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	1.1E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	7.9E-08
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	1.4E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.0E-08
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	1.2E-08	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	9.0E-10
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	2.2E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.6E-08
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	8.5E-09	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	6.2E-09
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	1.3E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	1.9E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	2.0E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	3.0E-07
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	3.5E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	2.7E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	1.7E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	1.0E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	3.7E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	2.6E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
		(Total)									
Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	2.1E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.5E-08
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.2E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.6E-07
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	2.9E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.1E-08
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	2.6E-08	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	1.9E-09
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	4.5E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	3.3E-08
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	1.8E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.3E-08
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	2.6E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	9.7E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.4E-07
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	5.6E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
		(Total)									
Total Risk Across All Exposure Routes/Pathways											8E-07

(1) Medium-Specific (M) EPC selected for hazard calculation.
N/A = Not Applicable
EPC = Exposure Point Concentration
Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.18.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	2.1E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.5E-07
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.3E-07	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.7E-06
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	2.9E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.1E-07
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	2.6E-07	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	1.9E-08
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	4.6E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	3.4E-07
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	1.8E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.3E-07
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	2.7E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	4.0E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	4.3E-06	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	6.5E-06
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	7.5E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	5.8E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	3.7E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	2.2E-04	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	7.9E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	5.6E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										9.0E-06
Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	2.3E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.7E-07
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.5E-07	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.8E-06
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	3.2E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.3E-07
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	2.9E-07	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	2.1E-08
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	5.0E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	3.7E-07
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	2.0E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.4E-07
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	3.0E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	1.1E-06	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.6E-06
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	6.3E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										4.4E-06
Total Risk Across All Exposure Routes/Pathways											1E-05

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.18.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: River/Stream
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	2.6E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.9E-08
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.9E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	2.1E-07
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	3.7E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.7E-08
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	3.3E-08	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	2.4E-09
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	5.8E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	4.2E-08
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	2.3E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.7E-08
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	3.4E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Antimony	2.5E+00	mg/kg	2.5E+00	mg/kg	M	5.0E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	5.4E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	8.1E-07
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	9.3E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	3.5E+02	mg/kg	3.5E+02	mg/kg	M	7.2E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	2.2E+02	mg/kg	2.2E+02	mg/kg	M	4.6E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	1.4E+03	mg/kg	1.4E+03	mg/kg	M	2.8E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	4.8E-01	mg/kg	4.8E-01	mg/kg	M	9.8E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Vanadium	3.4E+01	mg/kg	3.4E+01	mg/kg	M	7.0E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
		(Total)									
Dermal	Benzo(a)anthracene	1.3E+00	mg/kg	1.3E+00	mg/kg	M	5.8E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	4.2E-08
	Benzo(a)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	6.3E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	4.6E-07
	Benzo(b)fluoranthene	1.8E+00	mg/kg	1.8E+00	mg/kg	M	8.0E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	5.9E-08
	Benzo(k)fluoranthene	1.6E+00	mg/kg	1.6E+00	mg/kg	M	7.2E-08	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	5.2E-09
	Dibenz(a,h)anthracene	2.8E-01	mg/kg	2.8E-01	mg/kg	M	1.3E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	9.2E-08
	Indeno(1,2,3-cd)pyrene	1.1E+00	mg/kg	1.1E+00	mg/kg	M	4.9E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	3.6E-08
	Phenanthrene	1.7E+00	mg/kg	1.7E+00	mg/kg	M	7.4E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	2.6E+01	mg/kg	2.6E+01	mg/kg	M	2.7E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	4.1E-07
	Cadmium	4.6E+00	mg/kg	4.6E+00	mg/kg	M	1.6E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
		(Total)									
Total Risk Across All Exposure Routes/Pathways											2E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.
N/A = Not Applicable
EPC = Exposure Point Concentration
Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.19.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	9.4E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	6.9E-08
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	8.6E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	6.2E-07
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	1.6E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.2E-07
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	1.7E-07	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	1.2E-08
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	6.1E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	4.5E-08
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.5E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.8E-08
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	2.1E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	4.6E-09	mg/kg-day	2.0E+00	(mg/kg-day) ⁻¹	9.1E-09
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	1.8E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	5.7E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	8.6E-07
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	3.8E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	7.2E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	1.6E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	3.7E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	1.2E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	1.7E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										1.8E-06
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	9.8E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	7.1E-08
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	8.9E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	6.5E-07
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	1.7E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.2E-07
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	1.7E-07	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	1.3E-08
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	6.3E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	4.6E-08
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.5E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.9E-08
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	2.2E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	5.1E-09	mg/kg-day	2.0E+00	(mg/kg-day) ⁻¹	1.0E-08
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	1.4E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	2.1E-07
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	3.0E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										1.1E-06
Total Risk Across All Exposure Routes/Pathways											3E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.19.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	1.4E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.0E-08
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	1.2E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	9.1E-08
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	2.4E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.7E-08
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	2.4E-08	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	1.8E-09
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	8.9E-10	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	6.5E-09
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	3.6E-09	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.6E-09
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	3.1E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	6.6E-10	mg/kg-day	1.0E+00	(mg/kg-day) ⁻¹	6.6E-10
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	2.7E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	8.3E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.2E-07
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	5.5E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	1.0E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	2.4E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	5.3E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	1.8E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	2.5E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A	
	(Total)										2.5E-07
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	2.9E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.1E-08
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	2.6E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.9E-07
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	4.9E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	3.6E-08
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	5.0E-08	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	3.6E-09
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	1.8E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.3E-08
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	7.4E-09	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	5.4E-09
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	6.3E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	1.5E-09	mg/kg-day	1.0E+00	(mg/kg-day) ⁻¹	1.5E-09
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	4.0E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	6.0E-08
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	8.8E-10	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										3.3E-07
Total Risk Across All Exposure Routes/Pathways											6E-07

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.20.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	2.2E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.6E-07
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	2.0E-07	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.5E-06
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	3.8E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.8E-07
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	3.9E-07	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	2.8E-08
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	1.4E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.0E-07
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	5.7E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	4.2E-08
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	4.9E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	1.1E-08	mg/kg-day	2.0E+00	(mg/kg-day) ⁻¹	2.1E-08
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	4.3E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	1.3E-06	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	2.0E-06
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	8.8E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	1.7E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	3.8E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	8.5E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	2.9E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	4.0E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A	
	(Total)										4.1E-06
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	2.4E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.8E-07
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	2.2E-07	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.6E-06
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	4.2E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	3.0E-07
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	4.2E-07	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	3.1E-08
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	1.6E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.1E-07
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	6.2E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	4.6E-08
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	5.3E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	1.3E-08	mg/kg-day	2.0E+00	(mg/kg-day) ⁻¹	2.5E-08
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	3.4E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	5.0E-07
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	7.4E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										2.8E-06
Total Risk Across All Exposure Routes/Pathways											7E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.20.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	3.7E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.7E-08
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	3.3E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	2.4E-07
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	6.4E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	4.6E-08
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	6.4E-08	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	4.7E-09
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	2.4E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.7E-08
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	9.5E-09	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	7.0E-09
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	8.1E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	1.8E-09	mg/kg-day	1.0E+00	(mg/kg-day) ⁻¹	1.8E-09
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	7.1E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	2.2E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	3.3E-07
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	1.5E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	2.8E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	6.3E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	1.4E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	4.8E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	6.7E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										6.8E-07
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	8.0E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	5.8E-08
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	7.3E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	5.3E-07
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	1.4E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.0E-07
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	1.4E-07	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	1.0E-08
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	5.2E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	3.8E-08
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.1E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.5E-08
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	1.8E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	4.2E-09	mg/kg-day	1.0E+00	(mg/kg-day) ⁻¹	4.2E-09
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	1.1E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.7E-07
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	2.5E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										9.3E-07
Total Risk Across All Exposure Routes/Pathways											2E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.21.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	3.8E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.8E-07
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	3.4E-07	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	2.5E-06
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	6.5E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	4.8E-07
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	6.6E-07	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	4.8E-08
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	2.4E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.8E-07
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	9.8E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	7.2E-08
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	8.4E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	1.8E-08	mg/kg-day	2.0E+00	(mg/kg-day) ⁻¹	3.6E-08
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	7.3E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	2.3E-06	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	3.4E-06
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	1.5E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	2.9E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	6.5E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	1.5E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	5.0E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	6.9E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										7.0E-06
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	3.9E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.9E-07
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	3.5E-07	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	2.6E-06
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	6.8E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	4.9E-07
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	6.9E-07	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	5.0E-08
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	2.5E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.8E-07
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	1.0E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	7.4E-08
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	8.7E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	2.0E-08	mg/kg-day	2.0E+00	(mg/kg-day) ⁻¹	4.1E-08
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	5.5E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	8.2E-07
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	1.2E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										4.5E-06
Total Risk Across All Exposure Routes/Pathways											1E-05

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.21.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	4.1E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	3.0E-08
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	3.7E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	2.7E-07
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	7.1E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	5.2E-08
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	7.2E-08	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	5.3E-09
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	2.7E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.9E-08
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	1.1E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	7.8E-09
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	9.2E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	2.0E-09	mg/kg-day	1.0E+00	(mg/kg-day) ⁻¹	2.0E-09
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	8.0E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	2.5E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	3.7E-07
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	1.7E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	3.1E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	7.1E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	1.6E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	5.4E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	7.6E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										7.6E-07
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	8.6E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	6.2E-08
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	7.8E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	5.7E-07
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	1.5E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.1E-07
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	1.5E-07	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	1.1E-08
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	5.5E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	4.0E-08
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.2E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.6E-08
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	1.9E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	4.5E-09	mg/kg-day	1.0E+00	(mg/kg-day) ⁻¹	4.5E-09
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	1.2E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.8E-07
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	2.6E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										9.9E-07
Total Risk Across All Exposure Routes/Pathways											2E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.22.RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	8.8E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	6.4E-07
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	8.0E-07	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	5.8E-06
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	1.5E-06	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.1E-06
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	1.5E-06	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	1.1E-07
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	5.7E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	4.2E-07
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.3E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.7E-07
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	2.0E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	4.3E-08	mg/kg-day	2.0E+00	(mg/kg-day) ⁻¹	8.5E-08
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	1.7E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	5.3E-06	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	8.0E-06
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	3.5E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	6.7E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	1.5E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	3.4E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	1.2E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	1.6E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										1.6E-05
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	9.6E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	7.0E-07
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	8.7E-07	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	6.4E-06
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	1.7E-06	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.2E-06
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	1.7E-06	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	1.2E-07
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	6.2E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	4.5E-07
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.5E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.8E-07
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	2.1E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	5.0E-08	mg/kg-day	2.0E+00	(mg/kg-day) ⁻¹	1.0E-07
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	1.3E-06	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	2.0E-06
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	3.0E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										1.1E-05
Total Risk Across All Exposure Routes/Pathways											3E-05

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.22.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Wetland
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	1.1E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	8.0E-08
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	1.0E-07	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	7.3E-07
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	1.9E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.4E-07
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	1.9E-07	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	1.4E-08
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	7.1E-09	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	5.2E-08
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.9E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	2.1E-08
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	2.4E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	5.3E-09	mg/kg-day	1.0E+00	(mg/kg-day) ⁻¹	5.3E-09
	Antimony	1.0E+00	mg/kg	1.0E+00	mg/kg	M	2.1E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	6.7E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.0E-06
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	4.4E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	4.1E+02	mg/kg	4.1E+02	mg/kg	M	8.3E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	9.3E+01	mg/kg	9.3E+01	mg/kg	M	1.9E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	2.1E+02	mg/kg	2.1E+02	mg/kg	M	4.3E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	7.1E-01	mg/kg	7.1E-01	mg/kg	M	1.4E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Vanadium	9.9E+01	mg/kg	9.9E+01	mg/kg	M	2.0E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										2.0E-06
Dermal	Benzo(a)anthracene	5.4E+00	mg/kg	5.4E+00	mg/kg	M	2.4E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	1.8E-07
	Benzo(a)pyrene	4.9E+00	mg/kg	4.9E+00	mg/kg	M	2.2E-07	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.6E-06
	Benzo(b)fluoranthene	9.4E+00	mg/kg	9.4E+00	mg/kg	M	4.2E-07	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	3.0E-07
	Benzo(k)fluoranthene	9.5E+00	mg/kg	9.5E+00	mg/kg	M	4.2E-07	mg/kg-day	7.3E-02	(mg/kg-day) ⁻¹	3.1E-08
	Dibenz(a,h)anthracene	3.5E-01	mg/kg	3.5E-01	mg/kg	M	1.6E-08	mg/kg-day	7.3E+00	(mg/kg-day) ⁻¹	1.1E-07
	Indeno(1,2,3-cd)pyrene	1.4E+00	mg/kg	1.4E+00	mg/kg	M	6.2E-08	mg/kg-day	7.3E-01	(mg/kg-day) ⁻¹	4.6E-08
	Phenanthrene	1.2E+01	mg/kg	1.2E+01	mg/kg	M	5.3E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Aroclor 1248	2.6E-01	mg/kg	2.6E-01	mg/kg	M	1.3E-08	mg/kg-day	1.0E+00	(mg/kg-day) ⁻¹	1.3E-08
	Arsenic	3.3E+01	mg/kg	3.3E+01	mg/kg	M	3.4E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	5.0E-07
	Cadmium	2.2E+00	mg/kg	2.2E+00	mg/kg	M	7.4E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										2.8E-06
Total Risk Across All Exposure Routes/Pathways											5E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.23.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Sediment
 Exposure Medium: Sediment
 Exposure Point: Pond/Lake
 Receptor Population: 1-Day Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.4E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	5.2E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	7.8E-07
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	5.1E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	2.7E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	1.1E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	1.5E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	6.1E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	9.0E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A	
	(Total)										7.8E-07
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	1.2E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.9E-07
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	4.0E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										1.9E-07
Total Risk Across All Exposure Routes/Pathways											1E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.23.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Pond/Lake
Receptor Population: 1-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	3.6E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	7.6E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.1E-07
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	7.4E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	3.9E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	1.7E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	2.1E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	8.9E-10	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	1.3E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A	
	(Total)										1.1E-07
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	3.6E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	5.5E-08
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	1.2E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										5.5E-08
Total Risk Across All Exposure Routes/Pathways											2E-07

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.24.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Sediment
 Exposure Medium: Sediment
 Exposure Point: Pond/Lake
 Receptor Population: 1-Day Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	5.7E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	1.2E-06	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.8E-06
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	1.2E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	6.3E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	2.7E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	3.4E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	1.4E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	2.1E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A	
	(Total)										1.8E-06
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	3.1E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	4.6E-07
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	9.9E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										4.6E-07
Total Risk Across All Exposure Routes/Pathways											2E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.24.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Pond/Lake
Receptor Population: 1-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	9.5E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	2.0E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	3.0E-07
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	2.0E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	1.1E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	4.5E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	5.7E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	2.4E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	3.5E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A	
	(Total)										3.0E-07
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	1.0E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.5E-07
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	3.3E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										1.5E-07
Total Risk Across All Exposure Routes/Pathways											5E-07

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.25.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Sediment
 Exposure Medium: Sediment
 Exposure Point: Pond/Lake
 Receptor Population: 4-Day Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	9.8E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	2.1E-06	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	3.1E-06
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	2.0E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	1.1E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	4.6E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	5.8E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	2.4E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	3.6E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A	
	(Total)										3.1E-06
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	5.0E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	7.5E-07
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	1.6E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										7.5E-07
Total Risk Across All Exposure Routes/Pathways											4E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.25.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Pond/Lake
Receptor Population: 4-Day Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	1.1E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	2.3E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	3.4E-07
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	2.2E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	1.2E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	5.0E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	6.4E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	2.7E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	3.9E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A	
	(Total)										3.4E-07
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	1.1E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.6E-07
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	3.5E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										1.6E-07
Total Risk Across All Exposure Routes/Pathways											5E-07

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.26.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Sediment
 Exposure Medium: Sediment
 Exposure Point: Pond/Lake
 Receptor Population: 4-Day Recreational User
 Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.3E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	4.9E-06	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	7.3E-06
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	4.7E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	2.5E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	1.1E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	1.4E-04	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	5.7E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	8.4E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A	
	(Total)										7.3E-06
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	1.2E-06	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	1.8E-06
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	4.0E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										1.8E-06
Total Risk Across All Exposure Routes/Pathways											9E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.26.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Pond/Lake
Receptor Population: 4-Day Recreational User
Receptor Age: Young Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Antimony	1.4E+00	mg/kg	1.4E+00	mg/kg	M	2.8E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	6.1E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	9.1E-07
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	5.9E-08	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Chromium	1.6E+02	mg/kg	1.6E+02	mg/kg	M	3.2E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Copper	6.6E+01	mg/kg	6.6E+01	mg/kg	M	1.3E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Lead										
	Manganese	8.4E+02	mg/kg	8.4E+02	mg/kg	M	1.7E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	3.5E-01	mg/kg	3.5E-01	mg/kg	M	7.1E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
Vanadium	5.2E+01	mg/kg	5.2E+01	mg/kg	M	1.0E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A	
	(Total)										9.1E-07
Dermal	Arsenic	3.0E+01	mg/kg	3.0E+01	mg/kg	M	3.1E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	4.6E-07
	Cadmium	2.9E+00	mg/kg	2.9E+00	mg/kg	M	9.9E-09	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										4.6E-07
Total Risk Across All Exposure Routes/Pathways											1E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.27.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Fish Tissue
 Exposure Point: Fillet, Reference Locations
 Receptor Population: Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	4,4'-DDE	1.4E-02	mg/kg	1.4E-02	mg/kg	M	4.7E-07	mg/kg-day	3.4E-01	(mg/kg-day) ⁻¹	1.6E-07
	Aroclor-1260	6.3E-02	mg/kg	6.3E-02	mg/kg	M	2.1E-06	mg/kg-day	2.0E+00	(mg/kg-day) ⁻¹	4.1E-06
	Arsenic	4.8E-02	mg/kg	4.8E-02	mg/kg	M	1.6E-06	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	N/A
	Chromium	7.5E-01	mg/kg	7.5E-01	mg/kg	M	2.5E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	4.1E-01	mg/kg	4.1E-01	mg/kg	M	1.3E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Selenium	5.1E-01	mg/kg	5.1E-01	mg/kg	M	1.7E-05	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										
Total Risk Across All Exposure Routes/Pathways											4E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.27.CT
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Fish Tissue
Exposure Point: Fillet, Reference Locations
Receptor Population: Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	4,4'-DDE	1.4E-02	mg/kg	1.4E-02	mg/kg	M	6.9E-08	mg/kg-day	3.4E-01	(mg/kg-day) ⁻¹	2.3E-08
	Aroclor-1260	6.3E-02	mg/kg	6.3E-02	mg/kg	M	3.0E-07	mg/kg-day	1.0E+00	(mg/kg-day) ⁻¹	3.0E-07
	Arsenic	4.8E-02	mg/kg	4.8E-02	mg/kg	M	2.3E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	N/A
	Chromium	7.5E-01	mg/kg	7.5E-01	mg/kg	M	3.6E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	4.1E-01	mg/kg	4.1E-01	mg/kg	M	2.0E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Selenium	5.1E-01	mg/kg	5.1E-01	mg/kg	M	2.4E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										
Total Risk Across All Exposure Routes/Pathways											3E-07

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.28.RME
 CALCULATION OF CANCER RISKS
 REASONABLE MAXIMUM EXPOSURE

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Fish Tissue
 Exposure Point: Fillet, Reference Locations
 Receptor Population: Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	4,4'-DDE	1.4E-02	mg/kg	1.4E-02	mg/kg	M	1.3E-07	mg/kg-day	3.4E-01	(mg/kg-day) ⁻¹	4.5E-08
	Aroclor-1260	6.3E-02	mg/kg	6.3E-02	mg/kg	M	5.8E-07	mg/kg-day	2.0E+00	(mg/kg-day) ⁻¹	1.2E-06
	Arsenic	4.8E-02	mg/kg	4.8E-02	mg/kg	M	4.5E-07	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	N/A
	Chromium	7.5E-01	mg/kg	7.5E-01	mg/kg	M	7.0E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	4.1E-01	mg/kg	4.1E-01	mg/kg	M	3.8E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Selenium	5.1E-01	mg/kg	5.1E-01	mg/kg	M	4.7E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										
Total Risk Across All Exposure Routes/Pathways											1E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

TABLE 8.28.CT
 CALCULATION OF CANCER RISKS
 CENTRAL TENDENCY

INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current/Future
 Medium: Surface Water
 Exposure Medium: Fish Tissue
 Exposure Point: Fillet, Reference Locations
 Receptor Population: Recreational User
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	4,4'-DDE	1.4E-02	mg/kg	1.4E-02	mg/kg	M	2.2E-08	mg/kg-day	3.4E-01	(mg/kg-day) ⁻¹	7.5E-09
	Aroclor-1260	6.3E-02	mg/kg	6.3E-02	mg/kg	M	9.7E-08	mg/kg-day	1.0E+00	(mg/kg-day) ⁻¹	9.7E-08
	Arsenic	4.8E-02	mg/kg	4.8E-02	mg/kg	M	7.5E-08	mg/kg-day	1.5E+00	(mg/kg-day) ⁻¹	N/A
	Chromium	7.5E-01	mg/kg	7.5E-01	mg/kg	M	1.2E-06	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Mercury	4.1E-01	mg/kg	4.1E-01	mg/kg	M	6.3E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	Selenium	5.1E-01	mg/kg	5.1E-01	mg/kg	M	7.9E-07	mg/kg-day	N/A	(mg/kg-day) ⁻¹	N/A
	(Total)										
Total Risk Across All Exposure Routes/Pathways											1E-07

(1) Medium-Specific (M) EPC selected for hazard calculation.

-- Not detected at this exposure point.

N/A = Not Applicable

EPC = Exposure Point Concentration

Cancer Risk = Cancer Intake x Cancer Slope Factor

APPENDIX 6D

AIR MODELING

INDUSTRIAL WORKER

TABLE 1
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER TO AIR
 INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Future
 Medium: Groundwater
 Exposure Medium: Air

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Include? (Y/N) (2)
Study Area (a)	71-55-6	1,1,1-Trichloroethane	0.11 J	3.4	ug/L	IPGW-AE04-0088-020502	12 / 153	0.5 - 10	Y
	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.7	3.6	ug/L	IPGW-AE04-0088-020502	3 / 67	0.5 - 10	Y
	75-34-3	1,1-Dichloroethane	0.24 J	9.9	ug/L	IPGW-AC03-0033-041002	27 / 153	0.5 - 10	Y
	75-35-4	1,1-Dichloroethene	0.4 J	8.4	ug/L	IPGW-AE03-0050-020402	11 / 153	0.5 - 10	Y
	120-82-1	1,2,4-Trichlorobenzene	0.11 J	0.25 J	ug/L	IPGW-AP01-0019-012302	3 / 67	0.5 - 10	Y
	95-50-1	1,2-Dichlorobenzene	0.54	11	ug/L	CB5-02-GW-03	14 / 149	0.5 - 10	Y
	107-06-2	1,2-Dichloroethane	0.17 J	48	ug/L	CW5-05-GW-02R	2 / 153	0.5 - 10	Y
	541-73-1	1,3-Dichlorobenzene	0.11 J	1.25	ug/L	IPGW-AC03-0015-041102	2 / 67	0.5 - 10	Y
	106-46-7	1,4-Dichlorobenzene	0.125 J	6 J	ug/L	CB5-02-GW-03	10 / 149	0.5 - 10	Y
	78-93-3	2-Butanone	11	470	ug/L	CW5-05-GW-02R	8 / 153	3 - 100	Y
	108-10-1	4-Methyl-2-Pentanone	3 J	120	ug/L	CB5-03-GW-03	6 / 153	2 - 100	Y
	67-64-1	Acetone	6 J	16000	ug/L	CW5-05-GW-02R	17 / 153	3.3 - 100	Y
	71-43-2	Benzene	0.1 J	69000	ug/L	RX-17S	126 / 445	0.5 - 10	Y
	75-15-0	Carbon Disulfide	0.15 J	9	ug/L	CE4-03-GW-01NS-072301	5 / 153	0.5 - 10	Y
	108-90-7	Chlorobenzene	1 J	35	ug/L	CB3-02-GW-03	13 / 153	0.5 - 10	Y
	75-00-3	Chloroethane	37 J	37 J	ug/L	IPGW-AC05-0029-040802	1 / 153	0.5 - 10	Y
	67-66-3	Chloroform	0.43 J	4 J	ug/L	P1-03-GW-01	4 / 153	0.5 - 10	Y
	156-59-2	cis-1,2-Dichloroethene	0.2 J	50	ug/L	CW5-03-GW-03NS	21 / 153	0.5 - 10	Y
	100-41-4	Ethylbenzene	0.24 J	17	ug/L	CB6-03-GW-02	22 / 153	0.5 - 10	Y
	98-82-8	Isopropylbenzene	0.39 J	0.89 J	ug/L	IPGW-MW04-0036-032802	3 / 67	0.5 - 10	Y
	1634-04-4	Methyl tert-Butyl Ether	0.1 J	4000 J	ug/L	IPGW-AF02-0014-032702	29 / 70	0.5 - 2.5	Y
	100-42-5	Styrene	0.17 J	0.17 J	ug/L	IPGW-AC04-0028-040902	1 / 153	0.5 - 10	Y
	127-18-4	Tetrachloroethene	0.21 J	2 J	ug/L	CW5-03-GW-03NS	9 / 153	0.5 - 10	Y
	108-88-3	Toluene	0.21 J	3600	ug/L	B5-03-GW-03	79 / 445	0.2 - 10	Y
	156-60-5	trans-1,2-Dichloroethene	0.19 J	2.1	ug/L	IPGW-AC03-0015-041102	4 / 153	0.5 - 10	Y
	79-01-6	Trichloroethene	0.15 J	110 J	ug/L	IPGW-AE03-0050-020402	31 / 153	0.5 - 10	Y
	75-01-4	Vinyl Chloride	0.61	1.25 J	ug/L	IPGW-AC03-0015-041102	3 / 153	0.5 - 10	Y
	1330-20-7	Xylene, total	0.25 J	120	ug/L	CB6-03-GW-02	24 / 153	0.5 - 10	Y
	120-83-2	2,4-Dichlorophenol	1 J	35	ug/L	CW5-05-GW-02R	6 / 70	0.9 - 2	N
	105-67-9	2,4-Dimethylphenol	1 J	11	ug/L	CW5-05-GW-02R	7 / 70	0.9 - 2	N
	91-58-7	2-Chloronaphthalene	2 J	22	ug/L	CB6-03-GW-02	4 / 68	0.9 - 2	Y
	95-57-8	2-Chlorophenol	1 J	1 J	ug/L	CW5-05-GW-02R	1 / 70	0.9 - 2	Y
	95-48-7	2-Methylphenol	1 J	200	ug/L	CW5-05-GW-02R	7 / 70	0.9 - 2	N
	59-50-7	4-Chloro-3-methylphenol	2 J	22	ug/L	CW5-05-GW-02R	8 / 70	0.9 - 2	N
	106-44-5	4-Methylphenol	3 J	1900	ug/L	CW5-05-GW-02R	8 / 70	3 - 7	N
	83-32-9	Acenaphthene	1 J	1 J	ug/L	CW5-08-GW-01	1 / 68	0.9 - 2	Y
	117-81-7	bis(2-Ethylhexyl)phthalate	4 J	15	ug/L	P1-04-GW-04	4 / 67	2 - 4	N
	117-84-0	Di-n-octylphthalate	2 J	2 J	ug/L	P1-02-GW-04	1 / 68	2 - 4	N
	86-73-7	Fluorene	2 J	2 J	ug/L	CB7-03-GW-02R	1 / 68	0.9 - 2	Y

TABLE 1
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER TO AIR
 INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Future
 Medium: Groundwater
 Exposure Medium: Air

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Include? (Y/N) (2)
	91-20-3	Naphthalene	3 J	220	ug/L	CW5-05-GW-02R	12 / 68	0.9 - 2	Y
	86-30-6	N-Nitrosodiphenylamine	1 J	7 J	ug/L	CB4-03-GW-03	5 / 69	0.9 - 2	N
	87-86-5	Pentachlorophenol	10 J	10 J	ug/L	CW5-05-GW-02R	1 / 70	3 - 7	N
	108-95-2	Phenol	1 J	36	ug/L	CW5-05-GW-02R	11 / 70	0.9 - 2	N
Class A (a)	100-41-4	Ethylbenzene	0.2 J	0.49 J	ug/L	IPGW-CA03-0012-011102	3 / 18	0.5 - 0.71	Y
	1634-04-4	Methyl tert-Butyl Ether	1.7	1.7	ug/L	IPGW-CA02-0007-012502	1 / 18	0.5 - 1.6	Y
	108-88-3	Toluene	0.45 J	1.6	ug/L	IPGW-CA06-0007-011402	2 / 21	0.5 - 7.3	Y
	1330-20-7	Xylene, total	0.42 J	3.3	ug/L	IPGW-CA06-0007-011402	5 / 18	0.5 - 4	Y

(a) Refer to Appendix 6B, Table 5 for samples included for each exposure point.

(1) Minimum/maximum detected concentration.

(2) Only detected contaminants with Henry's Law constants >1E-05 atm-m³/mol and molecular weights <200 g/mol have been included.

TABLE 2
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER TO AIR - ONLY SELECTED ANALYTES
 INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Future
 Medium: Groundwater
 Exposure Medium: Air

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Include? (Y/N) (2)
Study Area (a)	71-55-6	1,1,1-Trichloroethane	0.11 J	3.4	ug/L	IPGW-AE04-0088-020502	12 / 153	0.5 - 10	Y
	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.7	3.6	ug/L	IPGW-AE04-0088-020502	3 / 67	0.5 - 10	Y
	75-34-3	1,1-Dichloroethane	0.24 J	9.9	ug/L	IPGW-AC03-0033-041002	27 / 153	0.5 - 10	Y
	75-35-4	1,1-Dichloroethene	0.4 J	8.4	ug/L	IPGW-AE03-0050-020402	11 / 153	0.5 - 10	Y
	120-82-1	1,2,4-Trichlorobenzene	0.11 J	0.25 J	ug/L	IPGW-AP01-0019-012302	3 / 67	0.5 - 10	Y
	95-50-1	1,2-Dichlorobenzene	0.54	11	ug/L	CB5-02-GW-03	14 / 149	0.5 - 10	Y
	107-06-2	1,2-Dichloroethane	0.17 J	48	ug/L	CW5-05-GW-02R	2 / 153	0.5 - 10	Y
	541-73-1	1,3-Dichlorobenzene	0.11 J	1.25	ug/L	IPGW-AC03-0015-041102	2 / 67	0.5 - 10	Y
	106-46-7	1,4-Dichlorobenzene	0.125 J	6 J	ug/L	CB5-02-GW-03	10 / 149	0.5 - 10	Y
	78-93-3	2-Butanone	11	470	ug/L	CW5-05-GW-02R	8 / 153	3 - 100	Y
	108-10-1	4-Methyl-2-Pentanone	3 J	120	ug/L	CB5-03-GW-03	6 / 153	2 - 100	Y
	67-64-1	Acetone	6 J	16000	ug/L	CW5-05-GW-02R	17 / 153	3.3 - 100	Y
	71-43-2	Benzene	0.1 J	69000	ug/L	RX-17S	126 / 445	0.5 - 10	Y
	75-15-0	Carbon Disulfide	0.15 J	9	ug/L	CE4-03-GW-01NS-072301	5 / 153	0.5 - 10	Y
	108-90-7	Chlorobenzene	1 J	35	ug/L	CB3-02-GW-03	13 / 153	0.5 - 10	Y
	75-00-3	Chloroethane	37 J	37 J	ug/L	IPGW-AC05-0029-040802	1 / 153	0.5 - 10	Y
	67-66-3	Chloroform	0.43 J	4 J	ug/L	P1-03-GW-01	4 / 153	0.5 - 10	Y
	156-59-2	cis-1,2-Dichloroethene	0.2 J	50	ug/L	CW5-03-GW-03NS	21 / 153	0.5 - 10	Y
	100-41-4	Ethylbenzene	0.24 J	17	ug/L	CB6-03-GW-02	22 / 153	0.5 - 10	Y
	98-82-8	Isopropylbenzene	0.39 J	0.89 J	ug/L	IPGW-MW04-0036-032802	3 / 67	0.5 - 10	Y
	1634-04-4	Methyl tert-Butyl Ether	0.1 J	4000 J	ug/L	IPGW-AF02-0014-032702	29 / 70	0.5 - 2.5	Y
	100-42-5	Styrene	0.17 J	0.17 J	ug/L	IPGW-AC04-0028-040902	1 / 153	0.5 - 10	Y
	127-18-4	Tetrachloroethene	0.21 J	2 J	ug/L	CW5-03-GW-03NS	9 / 153	0.5 - 10	Y
	108-88-3	Toluene	0.21 J	3600	ug/L	B5-03-GW-03	79 / 445	0.2 - 10	Y
	156-60-5	trans-1,2-Dichloroethene	0.19 J	2.1	ug/L	IPGW-AC03-0015-041102	4 / 153	0.5 - 10	Y
	79-01-6	Trichloroethene	0.15 J	110 J	ug/L	IPGW-AE03-0050-020402	31 / 153	0.5 - 10	Y
	75-01-4	Vinyl Chloride	0.61	1.25 J	ug/L	IPGW-AC03-0015-041102	3 / 153	0.5 - 10	Y
	1330-20-7	Xylene, total	0.25 J	120	ug/L	CB6-03-GW-02	24 / 153	0.5 - 10	Y
	91-58-7	2-Chloronaphthalene	2 J	22	ug/L	CB6-03-GW-02	4 / 68	0.9 - 2	Y
	95-57-8	2-Chlorophenol	1 J	1 J	ug/L	CW5-05-GW-02R	1 / 70	0.9 - 2	Y
	83-32-9	Acenaphthene	1 J	1 J	ug/L	CW5-08-GW-01	1 / 68	0.9 - 2	Y
	86-73-7	Fluorene	2 J	2 J	ug/L	CB7-03-GW-02R	1 / 68	0.9 - 2	Y
	91-20-3	Naphthalene	3 J	220	ug/L	CW5-05-GW-02R	12 / 68	0.9 - 2	Y

TABLE 2
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER TO AIR - ONLY SELECTED ANALYTES
 INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Include? (Y/N) (2)
Class A (a)	100-41-4	Ethylbenzene	0.2 J	0.49 J	ug/L	IPGW-CA03-0012-011102	3 / 18	0.5 - 0.71	Y
	1634-04-4	Methyl tert-Butyl Ether	1.7	1.7	ug/L	IPGW-CA02-0007-012502	1 / 18	0.5 - 1.6	Y
	108-88-3	Toluene	0.45 J	1.6	ug/L	IPGW-CA06-0007-011402	2 / 21	0.5 - 7.3	Y
	1330-20-7	Xylene, total	0.42 J	3.3	ug/L	IPGW-CA06-0007-011402	5 / 18	0.5 - 4	Y

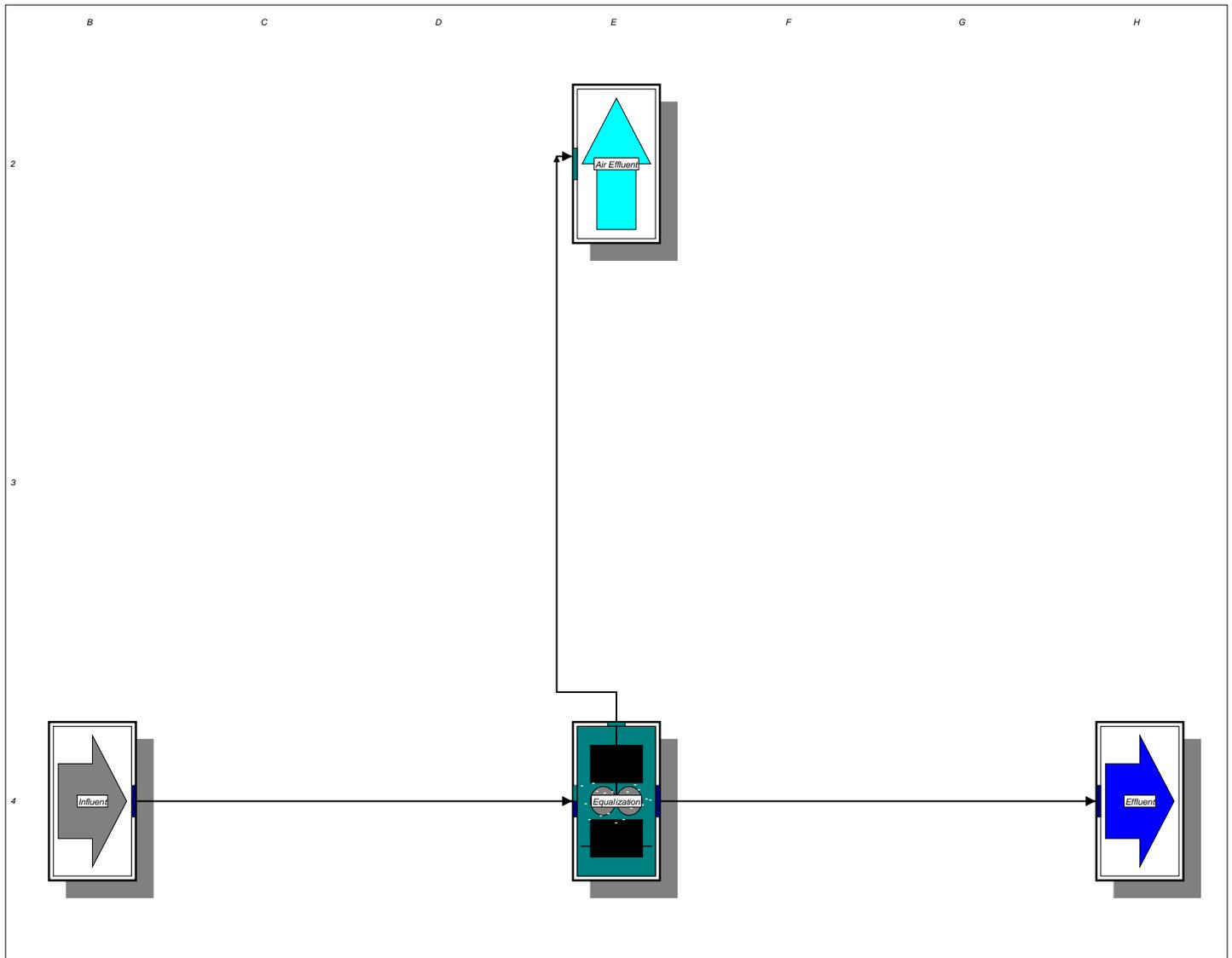
(a) Refer to Appendix 6B, Table 5 for samples included for each exposure point.

(1) Minimum/maximum detected concentration.

(2) Only detected contaminants with Henry's Law constants >1E-05 atm-m³/mol and molecular weights <200 g/mol have been included.

V3 Report

ISRT - Study Area Groundwater



Input Parameters Site Information for ISRT - Study Area Groundwater	
	Data Entry Value
Elevation (m)	100.00
Ambient Air Temperature (deg C)	15.00
Wind Speed (km/h)	10.00

Input Parameters for [B4] - Influent	
	Data Entry Value
Wastewater Flow Rate (m3/d)	545.10
Suspended Solids (mg/L)	10.00
Volatile SS Ratio (%)	0.00
Oil/Grease Concentration (mg/L)	0.00
Temperature (deg C)	15.00

V3 Report

Input Parameters for [E4] - Equalization	
	Data Entry Value
Depth (m)	3.05
Surface Area (m2)	9.29
Number of CSTRs	1
Air Flow Rate (m3/h)	0.00
Oxygen Transfer Efficiency (%)	6.00
Total Mixer Power (kW)	100.00
Standard Oxygen Transfer Rate (kgO2/kWh)	1.80
Dirty/Clean Water Correction	0.80
Covered	No
Ventilation Rate (m3/h)	100.00

Total Concentrations Site Information for ISRT - Study Area Groundwater		
	Cl Eff (ug/L)	Ct Eff (ug/L)
Acenaphthene	N/A	N/A
Acetone	N/A	N/A
Benzene	N/A	N/A
Carbon disulfide	N/A	N/A
Chlorobenzene	N/A	N/A
Chloroethane (ethyl chloride)	N/A	N/A
Chloroform (trichloromethane)	N/A	N/A
Chloronaphthalene,2-	N/A	N/A
Chlorophenol,2-	N/A	N/A
Cumene (isopropylbenzene)	N/A	N/A
Dichlorobenzene,1,2-	N/A	N/A
Dichlorobenzene,1,3-	N/A	N/A
Dichlorobenzene,1,4-	N/A	N/A
Dichloroethane,1,1-	N/A	N/A
Dichloroethane,1,2- (ethylene dichloride)	N/A	N/A
Dichloroethylene,1,1- (vinylidene chloride)	N/A	N/A
Dichloroethylene,1,2,cis-	N/A	N/A
Dichloroethylene,1,2-trans-	N/A	N/A
Ethylbenzene	N/A	N/A
Fluorene	N/A	N/A
Methyl ethyl ketone (2-butanone)	N/A	N/A
Methyl tert-butyl ether	N/A	N/A
Methyl-2-pentanone,4- (methyl isobutyl ketone)	N/A	N/A
Naphthalene	N/A	N/A
Styrene	N/A	N/A
Tetrachloroethylene	N/A	N/A
Toluene	N/A	N/A
Trichloro,1,2,2-,trifluoroethane,1,1,2- (freon 113)	N/A	N/A
Trichlorobenzene,1,2,4-	N/A	N/A
Trichloroethane,1,1,1- (methyl chloroform)	N/A	N/A
Trichloroethylene	N/A	N/A
Vinyl chloride (chloroethene)	N/A	N/A
Xylene,m- (1,3-xylene)	N/A	N/A
TOTAL	0.00	0.00

V3 Report

Total Concentrations for [B4] - Influent		
	Cl Eff (ug/L)	Ct Eff (ug/L)
Acenaphthene	1.00	1.00
Acetone	16000.00	16000.00
Benzene	69000.00	69000.00
Carbon disulfide	9.00	9.00
Chlorobenzene	35.00	35.00
Chloroethane (ethyl chloride)	37.00	37.00
Chloroform (trichloromethane)	4.00	4.00
Chloronaphthalene,2-	22.00	22.00
Chlorophenol,2-	1.00	1.00
Cumene (isopropylbenzene)	0.89	0.89
Dichlorobenzene,1,2-	11.00	11.00
Dichlorobenzene,1,3-	1.25	1.25
Dichlorobenzene,1,4-	6.00	6.00
Dichloroethane,1,1-	9.90	9.90
Dichloroethane,1,2- (ethylene dichloride)	48.00	48.00
Dichloroethylene,1,1- (vinylidene chloride)	8.40	8.40
Dichloroethylene,1,2,cis	50.00	50.00
Dichloroethylene,1,2-trans-	2.10	2.10
Ethylbenzene	17.00	17.00
Fluorene	2.00	2.00
Methyl ethyl ketone (2-butanone)	470.00	470.00
Methyl tert-butyl ether	4000.00	4000.00
Methyl-2-pentanone,4- (methyl isobutyl ketone)	120.00	120.00
Naphthalene	220.00	220.00
Styrene	0.17	0.17
Tetrachloroethylene	2.00	2.00
Toluene	3600.00	3600.00
Trichloro,1,2,2-,trifluoroethane,1,1,2- (freon 113)	3.60	3.60
Trichlorobenzene,1,2,4-	0.25	0.25
Trichloroethane,1,1,1- (methyl chloroform)	3.40	3.40
Trichloroethylene	110.00	110.00
Vinyl chloride (chloroethene)	1.25	1.25
Xylene,m- (1,3-xylene)	120.00	120.00
TOTAL	93916.21	93916.21

Total Concentrations for [E4] - Equalization		
	Cl Eff (ug/L)	Ct Eff (ug/L)
Acenaphthene	0.02	0.02
Acetone	1188.84	1188.84
Benzene	253.08	253.08
Carbon disulfide	0.03	0.03
Chlorobenzene	0.14	0.14
Chloroethane (ethyl chloride)	0.12	0.12
Chloroform (trichloromethane)	0.02	0.02
Chloronaphthalene,2-	0.29	0.29
Chlorophenol,2-	0.85	0.85
Cumene (isopropylbenzene)	3.465e-03	3.465e-03
Dichlorobenzene,1,2-	0.06	0.06
Dichlorobenzene,1,3-	5.315e-03	5.315e-03
Dichlorobenzene,1,4-	0.02	0.02
Dichloroethane,1,1-	0.03	0.03
Dichloroethane,1,2- (ethylene dichloride)	0.26	0.26
Dichloroethylene,1,1- (vinylidene chloride)	0.03	0.03
Dichloroethylene,1,2,cis	0.18	0.18
Dichloroethylene,1,2-trans-	6.945e-03	6.945e-03
Ethylbenzene	0.07	0.07
Fluorene	0.06	0.06
Methyl ethyl ketone (2-butanone)	6.12	6.12
Methyl tert-butyl ether	34.32	34.32
Methyl-2-pentanone,4- (methyl isobutyl ketone)	0.98	0.98
Naphthalene	2.19	2.19
Styrene	7.923e-04	7.923e-04
Tetrachloroethylene	6.991e-03	6.991e-03
Toluene	13.59	13.59
Trichloro,1,2,2-,trifluoroethane,1,1,2- (freon 113)	0.01	0.01
Trichlorobenzene,1,2,4-	1.279e-03	1.279e-03
Trichloroethane,1,1,1- (methyl chloroform)	0.01	0.01
Trichloroethylene	0.38	0.38
Vinyl chloride (chloroethene)	3.801e-03	3.801e-03
Xylene,m- (1,3-xylene)	0.47	0.47
TOTAL	1502.19	1502.19

Emissions Summary for Acenaphthene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	0.54	98.28	9.381e-03
[B4] Influent	1.00	0.00	0.00	0.55
[E4] Equalization	0.02	0.54	98.28	9.381e-03

V3 Report

Emissions Summary for Acetone				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	8073.55	92.57	648.04
[B4] Influent	16000.00	0.00	0.00	8721.59
[E4] Equalization	1188.84	8073.55	92.57	648.04

Emissions Summary for Benzene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	37473.90	99.63	137.95
[B4] Influent	69000.00	0.00	0.00	37611.85
[E4] Equalization	253.08	37473.90	99.63	137.95

Emissions Summary for Carbon disulfide				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	4.89	99.70	0.01
[B4] Influent	9.00	0.00	0.00	4.91
[E4] Equalization	0.03	4.89	99.70	0.01

Emissions Summary for Chlorobenzene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	19.00	99.60	0.08
[B4] Influent	35.00	0.00	0.00	19.08
[E4] Equalization	0.14	19.00	99.60	0.08

Emissions Summary for Chloroethane (ethyl chloride)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	20.11	99.68	0.06
[B4] Influent	37.00	0.00	0.00	20.17
[E4] Equalization	0.12	20.11	99.68	0.06

Emissions Summary for Chloroform (trichloromethane)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	2.17	99.61	8.402e-03
[B4] Influent	4.00	0.00	0.00	2.18
[E4] Equalization	0.02	2.17	99.61	8.402e-03

Emissions Summary for Chloronaphthalene,2-				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	11.83	98.66	0.16
[B4] Influent	22.00	0.00	0.00	11.99
[E4] Equalization	0.29	11.83	98.66	0.16

Emissions Summary for Chlorophenol,2-				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	0.08	15.17	0.46
[B4] Influent	1.00	0.00	0.00	0.55
[E4] Equalization	0.85	0.08	15.17	0.46

Emissions Summary for Cumene (isopropylbenzene)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	0.48	99.61	1.889e-03
[B4] Influent	0.89	0.00	0.00	0.49
[E4] Equalization	3.465e-03	0.48	99.61	1.889e-03

Emissions Summary for Dichlorobenzene,1,2-				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	5.97	99.49	0.03
[B4] Influent	11.00	0.00	0.00	6.00
[E4] Equalization	0.06	5.97	99.49	0.03

Emissions Summary for Dichlorobenzene,1,3-				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	0.68	99.57	2.897e-03
[B4] Influent	1.25	0.00	0.00	0.68
[E4] Equalization	5.315e-03	0.68	99.57	2.897e-03

Emissions Summary for Dichlorobenzene,1,4-				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	3.26	99.59	0.01
[B4] Influent	6.00	0.00	0.00	3.27
[E4] Equalization	0.02	3.26	99.59	0.01

V3 Report

Emissions Summary for Dichloroethane,1,1-				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	5.38	99.65	0.02
[B4] Influent	9.90	0.00	0.00	5.40
[E4] Equalization	0.03	5.38	99.65	0.02

Emissions Summary for Dichloroethane,1,2- (ethylene dichloride)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	26.02	99.45	0.14
[B4] Influent	48.00	0.00	0.00	26.16
[E4] Equalization	0.26	26.02	99.45	0.14

Emissions Summary for Dichloroethylene,1,1- (vinylidene chloride)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	4.56	99.68	0.01
[B4] Influent	8.40	0.00	0.00	4.58
[E4] Equalization	0.03	4.56	99.68	0.01

Emissions Summary for Dichloroethylene,1,2,cis				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	27.16	99.64	0.10
[B4] Influent	50.00	0.00	0.00	27.25
[E4] Equalization	0.18	27.16	99.64	0.10

Emissions Summary for Dichloroethylene,1,2-trans-				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	1.14	99.67	3.786e-03
[B4] Influent	2.10	0.00	0.00	1.14
[E4] Equalization	6.945e-03	1.14	99.67	3.786e-03

Emissions Summary for Ethylbenzene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	9.23	99.60	0.04
[B4] Influent	17.00	0.00	0.00	9.27
[E4] Equalization	0.07	9.23	99.60	0.04

Emissions Summary for Fluorene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	1.06	96.81	0.03
[B4] Influent	2.00	0.00	0.00	1.09
[E4] Equalization	0.06	1.06	96.81	0.03

Emissions Summary for Methyl ethyl ketone (2-butanone)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	252.86	98.70	3.34
[B4] Influent	470.00	0.00	0.00	256.20
[E4] Equalization	6.12	252.86	98.70	3.34

Emissions Summary for Methyl tert-butyl ether				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	2161.69	99.14	18.71
[B4] Influent	4000.00	0.00	0.00	2180.40
[E4] Equalization	34.32	2161.69	99.14	18.71

Emissions Summary for Methyl-2-pentanone,4- (methyl isobutyl ketone)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	64.88	99.19	0.53
[B4] Influent	120.00	0.00	0.00	65.41
[E4] Equalization	0.98	64.88	99.19	0.53

Emissions Summary for Naphthalene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	118.73	99.01	1.19
[B4] Influent	220.00	0.00	0.00	119.92
[E4] Equalization	2.19	118.73	99.01	1.19

Emissions Summary for Styrene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	0.09	99.53	4.319e-04
[B4] Influent	0.17	0.00	0.00	0.09
[E4] Equalization	7.923e-04	0.09	99.53	4.319e-04

V3 Report

Emissions Summary for Tetrachloroethylene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	1.09	99.65	3.811e-03
[B4] Influent	2.00	0.00	0.00	1.09
[E4] Equalization	6.991e-03	1.09	99.65	3.811e-03

Emissions Summary for Toluene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	1954.95	99.62	7.41
[B4] Influent	3600.00	0.00	0.00	1962.36
[E4] Equalization	13.59	1954.95	99.62	7.41

Emissions Summary for Trichloro,1,2,2-,trifluoroethane,1,1,2- (freon 113)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	1.96	99.65	6.844e-03
[B4] Influent	3.60	0.00	0.00	1.96
[E4] Equalization	0.01	1.96	99.65	6.844e-03

Emissions Summary for Trichlorobenzene,1,2,4-				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	0.14	99.49	6.971e-04
[B4] Influent	0.25	0.00	0.00	0.14
[E4] Equalization	1.279e-03	0.14	99.49	6.971e-04

Emissions Summary for Trichloroethane,1,1,1- (methyl chloroform)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	1.85	99.65	6.397e-03
[B4] Influent	3.40	0.00	0.00	1.85
[E4] Equalization	0.01	1.85	99.65	6.397e-03

Emissions Summary for Trichloroethylene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	59.75	99.65	0.21
[B4] Influent	110.00	0.00	0.00	59.96
[E4] Equalization	0.38	59.75	99.65	0.21

Emissions Summary for Vinyl chloride (chloroethene)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	0.68	99.70	2.072e-03
[B4] Influent	1.25	0.00	0.00	0.68
[E4] Equalization	3.801e-03	0.68	99.70	2.072e-03

Emissions Summary for Xylene,m- (1,3-xylene)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	65.16	99.61	0.26
[B4] Influent	120.00	0.00	0.00	65.41
[E4] Equalization	0.47	65.16	99.61	0.26

V3 Report

Total Compound Summary Site Information for ISRT - Study Area Groundwater					
	Infl (Proc) (g/d)	Mass Emit (g/d)	Mass WW (g/d)	Mass Sludge (g/d)	Mass Bio/Destr (g/d)
Acenaphthene	0.55	0.54	9.381e-03	0.00	0.00
Acetone	8721.59	8073.55	648.04	0.00	0.00
Benzene	37611.85	37473.90	137.95	0.00	1.114e-03
Carbon disulfide	4.91	4.89	0.01	0.00	0.00
Chlorobenzene	19.08	19.00	0.08	0.00	0.00
Chloroethane (ethyl chloride)	20.17	20.11	0.06	0.00	0.00
Chloroform (trichloromethane)	2.18	2.17	8.402e-03	0.00	0.00
Chloronaphthalene,2-	11.99	11.83	0.16	0.00	0.00
Chlorophenol,2-	0.55	0.08	0.46	0.00	0.00
Cumene (isopropylbenzene)	0.49	0.48	1.889e-03	0.00	0.00
Dichlorobenzene,1,2-	6.00	5.97	0.03	0.00	0.00
Dichlorobenzene,1,3-	0.68	0.68	2.897e-03	0.00	0.00
Dichlorobenzene,1,4-	3.27	3.26	0.01	0.00	0.00
Dichloroethane,1,1-	5.40	5.38	0.02	0.00	0.00
Dichloroethane,1,2- (ethylene dichloride)	26.16	26.02	0.14	0.00	0.00
Dichloroethylene,1,1- (vinylidene chloride)	4.58	4.56	0.01	0.00	0.00
Dichloroethylene,1,2,cis	27.25	27.16	0.10	0.00	0.00
Dichloroethylene,1,2-trans-	1.14	1.14	3.786e-03	0.00	0.00
Ethylbenzene	9.27	9.23	0.04	0.00	0.00
Fluorene	1.09	1.06	0.03	0.00	0.00
Methyl ethyl ketone (2-butanone)	256.20	252.86	3.34	0.00	1.907e-05
Methyl tert-butyl ether	2180.40	2161.69	18.71	0.00	0.00
Methyl-2-pentanone,4- (methyl isobutyl ketone)	65.41	64.88	0.53	0.00	0.00
Naphthalene	119.92	118.73	1.19	0.00	0.00
Styrene	0.09	0.09	4.319e-04	0.00	0.00
Tetrachloroethylene	1.09	1.09	3.811e-03	0.00	0.00
Toluene	1962.36	1954.95	7.41	0.00	6.437e-05
Trichloro,1,2,2-,trifluoroethane,1,1,2- (freon 113)	1.96	1.96	6.844e-03	0.00	0.00
Trichlorobenzene,1,2,4-	0.14	0.14	6.971e-04	0.00	0.00
Trichloroethane,1,1,1- (methyl chloroform)	1.85	1.85	6.397e-03	0.00	0.00
Trichloroethylene	59.96	59.75	0.21	0.00	0.00
Vinyl chloride (chloroethene)	0.68	0.68	2.072e-03	0.00	0.00
Xylene,m- (1,3-xylene)	65.41	65.16	0.26	0.00	0.00
TOTAL	51193.66	50374.81	818.84	0.00	1.197e-03

Total Compound Summary for [B4] - Influent					
	Infl (Proc) (g/d)	Mass Emit (g/d)	Mass WW (g/d)	Mass Sludge (g/d)	Mass Bio/Destr (g/d)
Acenaphthene	0.55	0.00	0.55	0.00	0.00
Acetone	8721.59	0.00	8721.59	0.00	0.00
Benzene	37611.85	0.00	37611.85	0.00	0.00
Carbon disulfide	4.91	0.00	4.91	0.00	0.00
Chlorobenzene	19.08	0.00	19.08	0.00	0.00
Chloroethane (ethyl chloride)	20.17	0.00	20.17	0.00	0.00
Chloroform (trichloromethane)	2.18	0.00	2.18	0.00	0.00
Chloronaphthalene,2-	11.99	0.00	11.99	0.00	0.00
Chlorophenol,2-	0.55	0.00	0.55	0.00	0.00
Cumene (isopropylbenzene)	0.49	0.00	0.49	0.00	0.00
Dichlorobenzene,1,2-	6.00	0.00	6.00	0.00	0.00
Dichlorobenzene,1,3-	0.68	0.00	0.68	0.00	0.00
Dichlorobenzene,1,4-	3.27	0.00	3.27	0.00	0.00
Dichloroethane,1,1-	5.40	0.00	5.40	0.00	0.00
Dichloroethane,1,2- (ethylene dichloride)	26.16	0.00	26.16	0.00	0.00
Dichloroethylene,1,1- (vinylidene chloride)	4.58	0.00	4.58	0.00	0.00
Dichloroethylene,1,2,cis	27.25	0.00	27.25	0.00	0.00
Dichloroethylene,1,2-trans-	1.14	0.00	1.14	0.00	0.00
Ethylbenzene	9.27	0.00	9.27	0.00	0.00
Fluorene	1.09	0.00	1.09	0.00	0.00
Methyl ethyl ketone (2-butanone)	256.20	0.00	256.20	0.00	0.00
Methyl tert-butyl ether	2180.40	0.00	2180.40	0.00	0.00
Methyl-2-pentanone,4- (methyl isobutyl ketone)	65.41	0.00	65.41	0.00	0.00
Naphthalene	119.92	0.00	119.92	0.00	0.00
Styrene	0.09	0.00	0.09	0.00	0.00
Tetrachloroethylene	1.09	0.00	1.09	0.00	0.00
Toluene	1962.36	0.00	1962.36	0.00	0.00
Trichloro,1,2,2-,trifluoroethane,1,1,2- (freon 113)	1.96	0.00	1.96	0.00	0.00
Trichlorobenzene,1,2,4-	0.14	0.00	0.14	0.00	0.00
Trichloroethane,1,1,1- (methyl chloroform)	1.85	0.00	1.85	0.00	0.00
Trichloroethylene	59.96	0.00	59.96	0.00	0.00
Vinyl chloride (chloroethene)	0.68	0.00	0.68	0.00	0.00
Xylene,m- (1,3-xylene)	65.41	0.00	65.41	0.00	0.00
TOTAL	51193.66	0.00	51193.66	0.00	0.00

V3 Report

Total Compound Summary for [E4] - Equalization					
	Infl (Proc) (g/d)	Mass Emit (g/d)	Mass WW (g/d)	Mass Sludge (g/d)	Mass Bio/Destr (g/d)
Acenaphthene	0.55	0.54	9.381e-03	0.00	0.00
Acetone	8721.59	8073.55	648.04	0.00	0.00
Benzene	37611.85	37473.90	137.95	0.00	1.114e-03
Carbon disulfide	4.91	4.89	0.01	0.00	0.00
Chlorobenzene	19.08	19.00	0.08	0.00	0.00
Chloroethane (ethyl chloride)	20.17	20.11	0.06	0.00	0.00
Chloroform (trichloromethane)	2.18	2.17	8.402e-03	0.00	0.00
Chloronaphthalene,2-	11.99	11.83	0.16	0.00	0.00
Chlorophenol,2-	0.55	0.08	0.46	0.00	0.00
Cumene (isopropylbenzene)	0.49	0.48	1.889e-03	0.00	0.00
Dichlorobenzene,1,2-	6.00	5.97	0.03	0.00	0.00
Dichlorobenzene,1,3-	0.68	0.68	2.897e-03	0.00	0.00
Dichlorobenzene,1,4-	3.27	3.26	0.01	0.00	0.00
Dichloroethane,1,1-	5.40	5.38	0.02	0.00	0.00
Dichloroethane,1,2- (ethylene dichloride)	26.16	26.02	0.14	0.00	0.00
Dichloroethylene,1,1- (vinylidene chloride)	4.58	4.56	0.01	0.00	0.00
Dichloroethylene,1,2,cis	27.25	27.16	0.10	0.00	0.00
Dichloroethylene,1,2-trans-	1.14	1.14	3.786e-03	0.00	0.00
Ethylbenzene	9.27	9.23	0.04	0.00	0.00
Fluorene	1.09	1.06	0.03	0.00	0.00
Methyl ethyl ketone (2-butanone)	256.20	252.86	3.34	0.00	1.907e-05
Methyl tert-butyl ether	2180.40	2161.69	18.71	0.00	0.00
Methyl-2-pentanone,4- (methyl isobutyl ketone)	65.41	64.88	0.53	0.00	0.00
Naphthalene	119.92	118.73	1.19	0.00	0.00
Styrene	0.09	0.09	4.319e-04	0.00	0.00
Tetrachloroethylene	1.09	1.09	3.811e-03	0.00	0.00
Toluene	1962.36	1954.95	7.41	0.00	6.437e-05
Trichloro,1,2,2-,trifluoroethane,1,1,2- (freon 113)	1.96	1.96	6.844e-03	0.00	0.00
Trichlorobenzene,1,2,4-	0.14	0.14	6.971e-04	0.00	0.00
Trichloroethane,1,1,1- (methyl chloroform)	1.85	1.85	6.397e-03	0.00	0.00
Trichloroethylene	59.96	59.75	0.21	0.00	0.00
Vinyl chloride (chloroethene)	0.68	0.68	2.072e-03	0.00	0.00
Xylene,m- (1,3-xylene)	65.41	65.16	0.26	0.00	0.00
TOTAL	51193.66	50374.81	818.84	0.00	1.197e-03

Description

A potential future use of site groundwater is as process water in an industrial facility. Conservative assumptions on water use rates, process tank dimensions/characteristics, and building ventilation rate must be made. Following assumption generation, the water fate model, Toxchem+, is used to estimate contaminant flux rates from the water to the building air. These flux rates are converted to indoor air concentrations using the assumptions noted above.

Assumptions

Groundwater Influent Rate: 100 gpm = 0.144 MGD

Tank Size: width: 10 ft
(Mixed Tank) length: 10 ft
depth: 10 ft

Building Ventilation Rate: 5000 cfm 203904 m³/d [divide g/d by vent. rate to get indoor air concentration]

Results from Toxchem+ for maximum influent concentrations

		<u>g/d</u>	<u>ug/m³</u>
Study Area Groundwater:	1,1,1-Trichloroethane	1.9	9.1
	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0	9.6
	1,1-Dichloroethane	5.4	26
	1,1-Dichloroethene	4.6	22
	1,2,4-Trichlorobenzene	0.14	0.69
	1,2-Dichlorobenzene	6.0	29
	1,2-Dichloroethane	26	128
	1,3-Dichlorobenzene	0.68	3.3
	1,4-Dichlorobenzene	3.3	16
	2-Butanone	253	1240
	4-Methyl-2-Pentanone	65	318
	Acetone	8074	39595
	Benzene	37474	183782
	Carbon Disulfide	4.9	24
	Chlorobenzene	19	93
	Chloroethane	20	99
	Chloroform	2.2	11
	cis-1,2-Dichloroethene	27	133
	Ethylbenzene	9.2	45
	Isopropylbenzene	0.48	2.4
	Methyl tert-Butyl Ether	2162	10602
	Styrene	0.090	0.44
	Tetrachloroethene	1.1	5.3
	Toluene	1955	9588
	trans-1,2-Dichloroethene	1.1	5.6
	Trichloroethene	60	293
Vinyl Chloride	0.68	3.3	
Xylene, total	65	320	
Class A Groundwater:	2-Chloronaphthalene	12	58
	2-Chlorophenol	0.080	0.39
	Acenaphthene	0.54	2.6
	Fluorene	1.1	5
	Naphthalene	119	582
	Ethylbenzene	0.27	1.3
	Methyl tert-Butyl Ether	0.92	4.5
Toluene	0.87	4.3	
Xylene, total	1.8	8.8	

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TABLE 3.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air

Exposure Point (1)	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution) (2)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (3)	Rationale (4)
Study Area	1,1-Dichloroethene	ug/L	6.3E-01	9.5E-01 (NP)	8.4E+00	9.5E-01	ug/L	95% UCL - NP	(f)
	1,2,4-Trichlorobenzene	ug/L	3.3E-01	4.5E-01 (NP)	2.5E-01 J	2.5E-01	ug/L	Max	(g)
	1,2-Dichlorobenzene	ug/L	6.8E-01	1.2E+00 (NP)	1.1E+01	1.2E+00	ug/L	95% UCL - NP	(f)
	1,2-Dichloroethane	ug/L	7.7E-01	2.1E+00 (NP)	4.8E+01	2.1E+00	ug/L	95% UCL - NP	(f)
	1,4-Dichlorobenzene	ug/L	5.7E-01	8.5E-01 (NP)	6.0E+00 J	8.5E-01	ug/L	95% UCL - NP	(f)
	2-Butanone	ug/L	7.2E+00	2.1E+01 (NP)	4.7E+02	2.1E+01	ug/L	95% UCL - NP	(f)
	4-Methyl-2-Pentanone	ug/L	4.6E+00	9.6E+00 (NP)	1.2E+02	9.6E+00	ug/L	95% UCL - NP	(f)
	Acetone	ug/L	1.5E+02	8.2E+02 (NP)	1.6E+04	8.2E+02	ug/L	95% UCL - NP	(f)
	Benzene	ug/L	5.8E+02	2.4E+03 (NP)	6.9E+04	2.4E+03	ug/L	95% UCL - NP	(f)
	Chlorobenzene	ug/L	1.4E+00	2.8E+00 (NP)	3.5E+01	2.8E+00	ug/L	95% UCL - NP	(f)
	Chloroethane	ug/L	1.0E+00	2.1E+00 (NP)	3.7E+01 J	2.1E+00	ug/L	95% UCL - NP	(f)
	Chloroform	ug/L	5.2E-01	7.4E-01 (NP)	4.0E+00 J	7.4E-01	ug/L	95% UCL - NP	(f)
	cis-1,2-Dichloroethene	ug/L	1.1E+00	2.6E+00 (NP)	5.0E+01	2.6E+00	ug/L	95% UCL - NP	(f)
	Methyl tert-Butyl Ether	ug/L	5.8E+01	4.1E+02 (NP)	4.0E+03 J	4.1E+02	ug/L	95% UCL - NP	(f)
	Tetrachloroethene	ug/L	4.9E-01	6.7E-01 (NP)	2.0E+00 J	6.7E-01	ug/L	95% UCL - NP	(f)
	Toluene	ug/L	7.0E+01	2.4E+02 (NP)	3.6E+03	2.4E+02	ug/L	95% UCL - NP	(f)
	Trichloroethene	ug/L	3.2E+00	9.5E+00 (NP)	1.1E+02 J	9.5E+00	ug/L	95% UCL - NP	(f)
	Vinyl Chloride	ug/L	4.8E-01	6.5E-01 (NP)	1.3E+00 J	6.5E-01	ug/L	95% UCL - NP	(f)
	Xylene, total	ug/L	2.9E+00	9.0E+00 (NP)	1.2E+02	9.0E+00	ug/L	95% UCL - NP	(f)
	2-Chloronaphthalene	ug/L	8.7E-01	2.3E+00 (NP)	2.2E+01	2.3E+00	ug/L	95% UCL - NP	(f)
	Naphthalene	ug/L	6.7E+00	2.8E+01 (NP)	2.2E+02	2.8E+01	ug/L	95% UCL - NP	(f)

TABLE 3.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air

Exposure Point (1)	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution) (2)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (3)	Rationale (4)
Class A	Methyl tert-Butyl Ether	ug/L	3.6E-01	7.3E-01 (NP)	1.7E+00	7.3E-01	ug/L	95% UCL - NP	(f)

(1) Refer to Appendix 6B, Table 5 for sample groupings for each exposure point; only COPCs selected on Table 2.10 appear.

(2) T - Transformed; N - Normal; NP - Non-parametric; G - Gamma; <4 - sample size too small to calculate 95% UCL

(3) Statistics: Maximum Detected Value (Max); 95% UCL of Transformed Data (95% UCL - T); 95% UCL of Normal Data (95% UCL - N); 95% UCL of Non-parametric Data (95% UCL - NP); 95% UCL of Gamma Distributed Data (95% UCL - G); Arithmetic Mean (Mean)

(4) Rationale:

- (a) Due to small sample size (<4), the maximum detected concentration is used.
- (b) When the maximum detected concentration is selected as the RME EPC, the arithmetic mean concentration is selected as the CT EPC.
- (c) If the arithmetic mean concentration equals or exceeds the maximum detected concentration, the maximum detected concentration is used as the CT EPC.
- (d) Shapiro-Wilk W Test or Lilliefors Test indicates data are normally distributed.
- (e) Shapiro-Wilk W Test or Lilliefors Test indicates data are log-normally distributed.
- (f) Shapiro-Wilk W Test or Lilliefors Test indicates data are neither normally nor log-normally distributed.
- (g) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC
- (h) A-D Test and/or K-S Test indicates data are gamma distributed.

J = Estimated Concentration

Max = Maximum Detected Concentration

N/A = Not Applicable

UCL = Upper Confidence Limit

EPC = Exposure Point Concentration

RME = Reasonable Maximum Exposure

CT = Central Tendency

TABLE 3.CT
EXPOSURE POINT CONCENTRATION SUMMARY
CENTRAL TENDENCY EXPOSURE
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air

Exposure Point (1)	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution) (2)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (3)	Rationale (4)
Study Area	1,1-Dichloroethene	ug/L	6.3E-01	9.5E-01 (NP)	8.4E+00	9.5E-01	ug/L	95% UCL - NP	(f)
	1,2,4-Trichlorobenzene	ug/L	3.3E-01	4.5E-01 (NP)	2.5E-01 J	2.5E-01	ug/L	Max	(c)
	1,2-Dichlorobenzene	ug/L	6.8E-01	1.2E+00 (NP)	1.1E+01	1.2E+00	ug/L	95% UCL - NP	(f)
	1,2-Dichloroethane	ug/L	7.7E-01	2.1E+00 (NP)	4.8E+01	2.1E+00	ug/L	95% UCL - NP	(f)
	1,4-Dichlorobenzene	ug/L	5.7E-01	8.5E-01 (NP)	6.0E+00 J	8.5E-01	ug/L	95% UCL - NP	(f)
	2-Butanone	ug/L	7.2E+00	2.1E+01 (NP)	4.7E+02	2.1E+01	ug/L	95% UCL - NP	(f)
	4-Methyl-2-Pentanone	ug/L	4.6E+00	9.6E+00 (NP)	1.2E+02	9.6E+00	ug/L	95% UCL - NP	(f)
	Acetone	ug/L	1.5E+02	8.2E+02 (NP)	1.6E+04	8.2E+02	ug/L	95% UCL - NP	(f)
	Benzene	ug/L	5.8E+02	2.4E+03 (NP)	6.9E+04	2.4E+03	ug/L	95% UCL - NP	(f)
	Chlorobenzene	ug/L	1.4E+00	2.8E+00 (NP)	3.5E+01	2.8E+00	ug/L	95% UCL - NP	(f)
	Chloroethane	ug/L	1.0E+00	2.1E+00 (NP)	3.7E+01 J	2.1E+00	ug/L	95% UCL - NP	(f)
	Chloroform	ug/L	5.2E-01	7.4E-01 (NP)	4.0E+00 J	7.4E-01	ug/L	95% UCL - NP	(f)
	cis-1,2-Dichloroethene	ug/L	1.1E+00	2.6E+00 (NP)	5.0E+01	2.6E+00	ug/L	95% UCL - NP	(f)
	Methyl tert-Butyl Ether	ug/L	5.8E+01	4.1E+02 (NP)	4.0E+03 J	4.1E+02	ug/L	95% UCL - NP	(f)
	Tetrachloroethene	ug/L	4.9E-01	6.7E-01 (NP)	2.0E+00 J	6.7E-01	ug/L	95% UCL - NP	(f)
	Toluene	ug/L	7.0E+01	2.4E+02 (NP)	3.6E+03	2.4E+02	ug/L	95% UCL - NP	(f)
	Trichloroethene	ug/L	3.2E+00	9.5E+00 (NP)	1.1E+02 J	9.5E+00	ug/L	95% UCL - NP	(f)
	Vinyl Chloride	ug/L	4.8E-01	6.5E-01 (NP)	1.3E+00 J	6.5E-01	ug/L	95% UCL - NP	(f)
	Xylene, total	ug/L	2.9E+00	9.0E+00 (NP)	1.2E+02	9.0E+00	ug/L	95% UCL - NP	(f)
	2-Chloronaphthalene	ug/L	8.7E-01	2.3E+00 (NP)	2.2E+01	2.3E+00	ug/L	95% UCL - NP	(f)
	Naphthalene	ug/L	6.7E+00	2.8E+01 (NP)	2.2E+02	2.8E+01	ug/L	95% UCL - NP	(f)

TABLE 3.CT
EXPOSURE POINT CONCENTRATION SUMMARY
CENTRAL TENDENCY EXPOSURE
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air

Exposure Point (1)	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution) (2)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (3)	Rationale (4)
Class A	Methyl tert-Butyl Ether	ug/L	3.6E-01	7.3E-01 (NP)	1.7E+00	7.3E-01	ug/L	95% UCL - NP	(f)

(1) Refer to Appendix 6B, Table 5 for sample groupings for each exposure point; only COPCs selected on Table 2.10 appear.

(2) T - Transformed; N - Normal; NP - Non-parametric; G - Gamma; <4 - sample size too small to calculate 95% UCL

(3) Statistics: Maximum Detected Value (Max); 95% UCL of Transformed Data (95% UCL - T); 95% UCL of Normal Data (95% UCL - N); 95% UCL of Non-parametric Data (95% UCL - NP); 95% UCL of Gamma Distributed Data (95% UCL - G); Arithmetic Mean (Mean)

(4) Rationale:

- (a) Due to small sample size (<4), the maximum detected concentration is used.
- (b) When the maximum detected concentration is selected as the RME EPC, the arithmetic mean concentration is selected as the CT EPC.
- (c) If the arithmetic mean concentration equals or exceeds the maximum detected concentration, the maximum detected concentration is used as the CT EPC.
- (d) Shapiro-Wilk W Test or Lilliefors Test indicates data are normally distributed.
- (e) Shapiro-Wilk W Test or Lilliefors Test indicates data are log-normally distributed.
- (f) Shapiro-Wilk W Test or Lilliefors Test indicates data are neither normally nor log-normally distributed.
- (g) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC
- (h) A-D Test and/or K-S Test indicates data are gamma distributed.

J = Estimated Concentration

Max = Maximum Detected Concentration

N/A = Not Applicable

UCL = Upper Confidence Limit

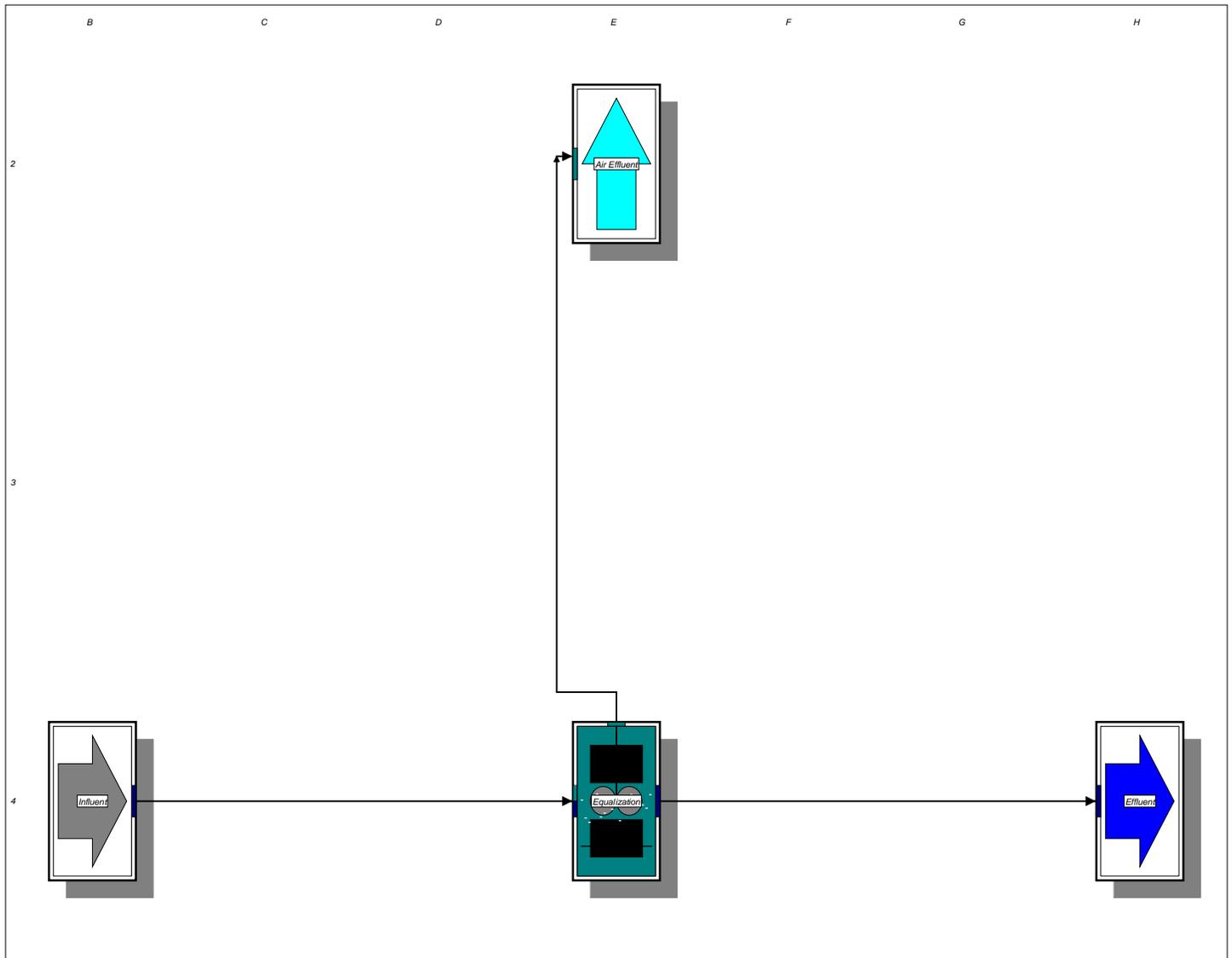
EPC = Exposure Point Concentration

RME = Reasonable Maximum Exposure

CT = Central Tendency

V3 Report

ISRT - Study Area Groundwater



Input Parameters Site Information for ISRT - Study Area Groundwater	
	Data Entry Value
Elevation (m)	100.00
Ambient Air Temperature (deg C)	15.00
Wind Speed (km/h)	10.00

Input Parameters for [B4] - Influent	
	Data Entry Value
Wastewater Flow Rate (m3/d)	545.10
Suspended Solids (mg/L)	10.00
Volatile SS Ratio (%)	0.00
Oil/Grease Concentration (mg/L)	0.00
Temperature (deg C)	15.00

V3 Report

Input Parameters for [E4] - Equalization	
	Data Entry Value
Depth (m)	3.05
Surface Area (m2)	9.29
Number of CSTRs	1
Air Flow Rate (m3/h)	0.00
Oxygen Transfer Efficiency (%)	6.00
Total Mixer Power (kW)	100.00
Standard Oxygen Transfer Rate (kgO2/kWh)	1.80
Dirty/Clean Water Correction	0.80
Covered	No
Ventilation Rate (m3/h)	100.00

Total Concentrations Site Information for ISRT - Study Area Groundwater		
	CI Eff (ug/L)	Ct Eff (ug/L)
Acetone	N/A	N/A
Benzene	N/A	N/A
Chlorobenzene	N/A	N/A
Chloroethane (ethyl chloride)	N/A	N/A
Chloroform (trichloromethane)	N/A	N/A
Chloronaphthalene,2-	N/A	N/A
Dichlorobenzene,1,2-	N/A	N/A
Dichlorobenzene,1,4-	N/A	N/A
Dichloroethane,1,2- (ethylene dichloride)	N/A	N/A
Dichloroethylene,1,1- (vinylidene chloride)	N/A	N/A
Dichloroethylene,1,2,cis	N/A	N/A
Methyl ethyl ketone (2-butanone)	N/A	N/A
Methyl tert-butyl ether	N/A	N/A
Methyl-2-pentanone,4- (methyl isobutyl ketone)	N/A	N/A
Naphthalene	N/A	N/A
Tetrachloroethylene	N/A	N/A
Toluene	N/A	N/A
Trichlorobenzene,1,2,4-	N/A	N/A
Trichloroethylene	N/A	N/A
Vinyl chloride (chloroethene)	N/A	N/A
Xylene,m- (1,3-xylene)	N/A	N/A
TOTAL	0.00	0.00

Total Concentrations for [B4] - Influent		
	CI Eff (ug/L)	Ct Eff (ug/L)
Acetone	820.00	820.00
Benzene	2400.00	2400.00
Chlorobenzene	2.80	2.80
Chloroethane (ethyl chloride)	2.10	2.10
Chloroform (trichloromethane)	0.74	0.74
Chloronaphthalene,2-	2.30	2.30
Dichlorobenzene,1,2-	1.20	1.20
Dichlorobenzene,1,4-	0.85	0.85
Dichloroethane,1,2- (ethylene dichloride)	2.10	2.10
Dichloroethylene,1,1- (vinylidene chloride)	0.95	0.95
Dichloroethylene,1,2,cis	2.60	2.60
Methyl ethyl ketone (2-butanone)	21.00	21.00
Methyl tert-butyl ether	410.00	410.00
Methyl-2-pentanone,4- (methyl isobutyl ketone)	9.60	9.60
Naphthalene	28.00	28.00
Tetrachloroethylene	0.67	0.67
Toluene	240.00	240.00
Trichlorobenzene,1,2,4-	0.25	0.25
Trichloroethylene	9.50	9.50
Vinyl chloride (chloroethene)	0.65	0.65
Xylene,m- (1,3-xylene)	9.00	9.00
TOTAL	3964.31	3964.31

V3 Report

Total Concentrations for [E4] - Equalization		
	Ct Eff (ug/L)	Ct Eff (ug/L)
Acetone	60.93	60.93
Benzene	8.80	8.80
Chlorobenzene	0.01	0.01
Chloroethane (ethyl chloride)	6.617e-03	6.617e-03
Chloroform (trichloromethane)	2.852e-03	2.852e-03
Chloronaphthalene,2-	0.03	0.03
Dichlorobenzene,1,2-	6.066e-03	6.066e-03
Dichlorobenzene,1,4-	3.518e-03	3.518e-03
Dichloroethane,1,2- (ethylene dichloride)	0.01	0.01
Dichloroethylene,1,1- (vinylidene chloride)	3.019e-03	3.019e-03
Dichloroethylene,1,2,cis	9.308e-03	9.308e-03
Methyl ethyl ketone (2-butanone)	0.27	0.27
Methyl tert-butyl ether	3.52	3.52
Methyl-2-pentanone,4- (methyl isobutyl ketone)	0.08	0.08
Naphthalene	0.28	0.28
Tetrachloroethylene	2.342e-03	2.342e-03
Toluene	0.91	0.91
Trichlorobenzene,1,2,4-	1.279e-03	1.279e-03
Trichloroethylene	0.03	0.03
Vinyl chloride (chloroethene)	1.977e-03	1.977e-03
Xylene,m- (1,3-xylene)	0.04	0.04
TOTAL	74.94	74.94

Emissions Summary for Acetone				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	413.77	92.57	33.21
[B4] Influent	820.00	0.00	0.00	446.98
[E4] Equalization	60.93	413.77	92.57	33.21

Emissions Summary for Benzene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	1303.44	99.63	4.80
[B4] Influent	2400.00	0.00	0.00	1308.24
[E4] Equalization	8.80	1303.44	99.63	4.80

Emissions Summary for Chlorobenzene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	1.52	99.60	6.101e-03
[B4] Influent	2.80	0.00	0.00	1.53
[E4] Equalization	0.01	1.52	99.60	6.101e-03

Emissions Summary for Chloroethane (ethyl chloride)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	1.14	99.68	3.607e-03
[B4] Influent	2.10	0.00	0.00	1.14
[E4] Equalization	6.617e-03	1.14	99.68	3.607e-03

Emissions Summary for Chloroform (trichloromethane)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	0.40	99.61	1.554e-03
[B4] Influent	0.74	0.00	0.00	0.40
[E4] Equalization	2.852e-03	0.40	99.61	1.554e-03

Emissions Summary for Chloronaphthalene,2-				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	1.24	98.66	0.02
[B4] Influent	2.30	0.00	0.00	1.25
[E4] Equalization	0.03	1.24	98.66	0.02

Emissions Summary for Dichlorobenzene,1,2-				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	0.65	99.49	3.306e-03
[B4] Influent	1.20	0.00	0.00	0.65
[E4] Equalization	6.066e-03	0.65	99.49	3.306e-03

Emissions Summary for Dichlorobenzene,1,4-				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	0.46	99.59	1.917e-03
[B4] Influent	0.85	0.00	0.00	0.46
[E4] Equalization	3.518e-03	0.46	99.59	1.917e-03

V3 Report

Emissions Summary for Dichloroethane,1,2- (ethylene dichloride)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	1.14	99.45	6.307e-03
[B4] Influent	2.10	0.00	0.00	1.14
[E4] Equalization	0.01	1.14	99.45	6.307e-03

Emissions Summary for Dichloroethylene,1,1- (vinylidene chloride)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	0.52	99.68	1.646e-03
[B4] Influent	0.95	0.00	0.00	0.52
[E4] Equalization	3.019e-03	0.52	99.68	1.646e-03

Emissions Summary for Dichloroethylene,1,2,cis				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	1.41	99.64	5.074e-03
[B4] Influent	2.60	0.00	0.00	1.42
[E4] Equalization	9.308e-03	1.41	99.64	5.074e-03

Emissions Summary for Methyl ethyl ketone (2-butanone)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	11.30	98.70	0.15
[B4] Influent	21.00	0.00	0.00	11.45
[E4] Equalization	0.27	11.30	98.70	0.15

Emissions Summary for Methyl tert-butyl ether				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	221.57	99.14	1.92
[B4] Influent	410.00	0.00	0.00	223.49
[E4] Equalization	3.52	221.57	99.14	1.92

Emissions Summary for Methyl-2-pentanone,4- (methyl isobutyl ketone)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	5.19	99.19	0.04
[B4] Influent	9.60	0.00	0.00	5.23
[E4] Equalization	0.08	5.19	99.19	0.04

Emissions Summary for Naphthalene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	15.11	99.01	0.15
[B4] Influent	28.00	0.00	0.00	15.26
[E4] Equalization	0.28	15.11	99.01	0.15

Emissions Summary for Tetrachloroethylene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	0.36	99.65	1.277e-03
[B4] Influent	0.67	0.00	0.00	0.37
[E4] Equalization	2.342e-03	0.36	99.65	1.277e-03

Emissions Summary for Toluene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	130.33	99.62	0.49
[B4] Influent	240.00	0.00	0.00	130.82
[E4] Equalization	0.91	130.33	99.62	0.49

Emissions Summary for Trichlorobenzene,1,2,4-				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	0.14	99.49	6.971e-04
[B4] Influent	0.25	0.00	0.00	0.14
[E4] Equalization	1.279e-03	0.14	99.49	6.971e-04

Emissions Summary for Trichloroethylene				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	5.16	99.65	0.02
[B4] Influent	9.50	0.00	0.00	5.18
[E4] Equalization	0.03	5.16	99.65	0.02

Emissions Summary for Vinyl chloride (chloroethene)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	0.35	99.70	1.077e-03
[B4] Influent	0.65	0.00	0.00	0.35
[E4] Equalization	1.977e-03	0.35	99.70	1.077e-03

V3 Report

Emissions Summary for Xylene,m- (1,3-xylene)				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	4.89	99.61	0.02
[B4] Influent	9.00	0.00	0.00	4.91
[E4] Equalization	0.04	4.89	99.61	0.02

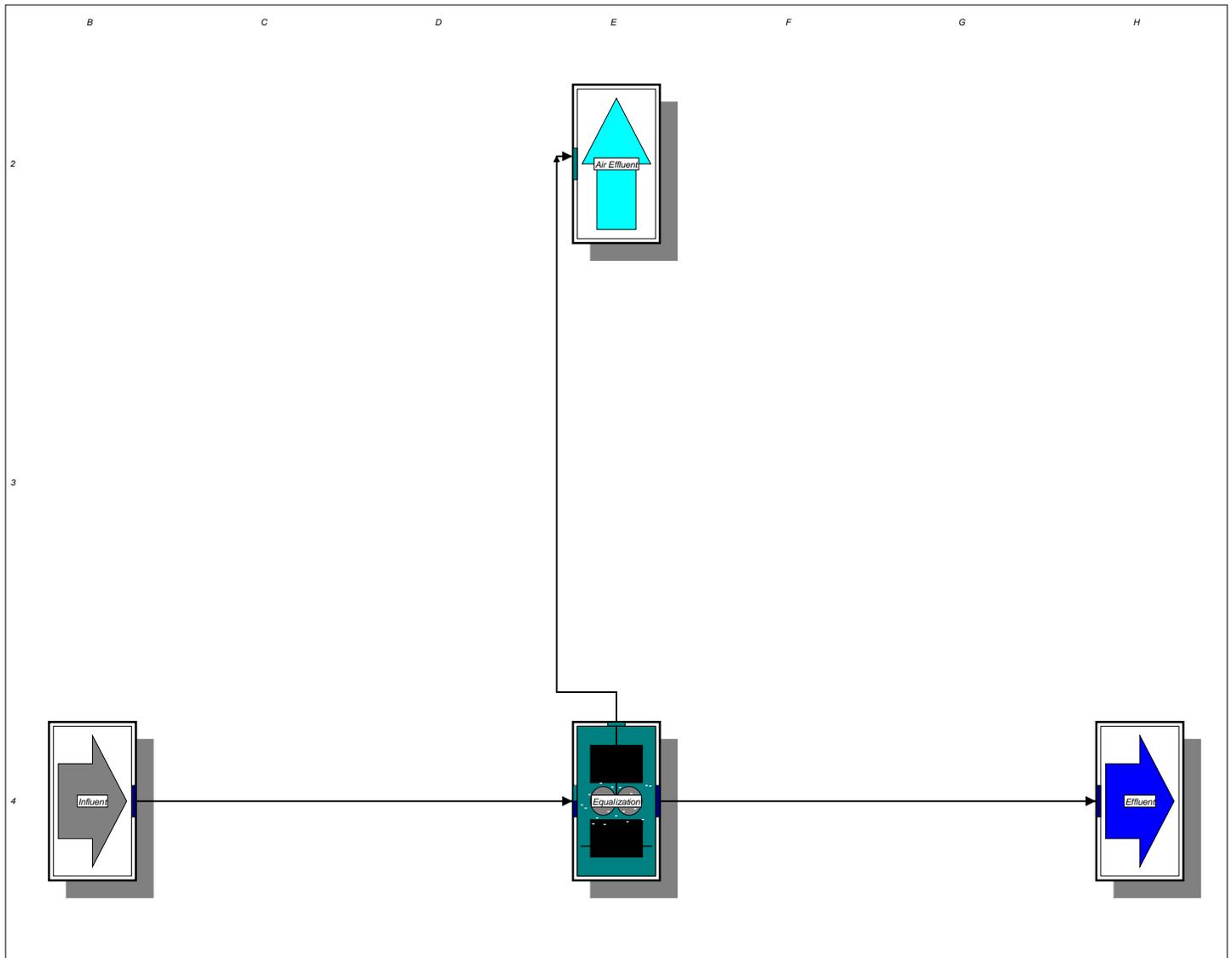
Total Compound Summary Site Information for ISRT - Study Area Groundwater					
	Infl (Proc) (g/d)	Mass Emit (g/d)	Mass WW (g/d)	Mass Sludge (g/d)	Mass Bio/Destr (g/d)
Acetone	446.98	413.77	33.21	0.00	0.00
Benzene	1308.24	1303.44	4.80	0.00	0.00
Chlorobenzene	1.53	1.52	6.101e-03	0.00	0.00
Chloroethane (ethyl chloride)	1.14	1.14	3.607e-03	0.00	0.00
Chloroform (trichloromethane)	0.40	0.40	1.554e-03	0.00	0.00
Chloronaphthalene,2-	1.25	1.24	0.02	0.00	0.00
Dichlorobenzene,1,2-	0.65	0.65	3.306e-03	0.00	0.00
Dichlorobenzene,1,4-	0.46	0.46	1.917e-03	0.00	0.00
Dichloroethane,1,2- (ethylene dichloride)	1.14	1.14	6.307e-03	0.00	0.00
Dichloroethylene,1,1- (vinylidene chloride)	0.52	0.52	1.646e-03	0.00	0.00
Dichloroethylene,1,2,cis	1.42	1.41	5.074e-03	0.00	0.00
Methyl ethyl ketone (2-butanone)	11.45	11.30	0.15	0.00	0.00
Methyl tert-butyl ether	223.49	221.57	1.92	0.00	0.00
Methyl-2-pentanone,4- (methyl isobutyl ketone)	5.23	5.19	0.04	0.00	0.00
Naphthalene	15.26	15.11	0.15	0.00	0.00
Tetrachloroethylene	0.37	0.36	1.277e-03	0.00	0.00
Toluene	130.82	130.33	0.49	0.00	0.00
Trichlorobenzene,1,2,4-	0.14	0.14	6.971e-04	0.00	0.00
Trichloroethylene	5.18	5.16	0.02	0.00	0.00
Vinyl chloride (chloroethene)	0.35	0.35	1.077e-03	0.00	0.00
Xylene,m- (1,3-xylene)	4.91	4.89	0.02	0.00	0.00
TOTAL	2160.94	2120.09	40.85	0.00	0.00

Total Compound Summary for [B4] - Influent					
	Infl (Proc) (g/d)	Mass Emit (g/d)	Mass WW (g/d)	Mass Sludge (g/d)	Mass Bio/Destr (g/d)
Acetone	446.98	0.00	446.98	0.00	0.00
Benzene	1308.24	0.00	1308.24	0.00	0.00
Chlorobenzene	1.53	0.00	1.53	0.00	0.00
Chloroethane (ethyl chloride)	1.14	0.00	1.14	0.00	0.00
Chloroform (trichloromethane)	0.40	0.00	0.40	0.00	0.00
Chloronaphthalene,2-	1.25	0.00	1.25	0.00	0.00
Dichlorobenzene,1,2-	0.65	0.00	0.65	0.00	0.00
Dichlorobenzene,1,4-	0.46	0.00	0.46	0.00	0.00
Dichloroethane,1,2- (ethylene dichloride)	1.14	0.00	1.14	0.00	0.00
Dichloroethylene,1,1- (vinylidene chloride)	0.52	0.00	0.52	0.00	0.00
Dichloroethylene,1,2,cis	1.42	0.00	1.42	0.00	0.00
Methyl ethyl ketone (2-butanone)	11.45	0.00	11.45	0.00	0.00
Methyl tert-butyl ether	223.49	0.00	223.49	0.00	0.00
Methyl-2-pentanone,4- (methyl isobutyl ketone)	5.23	0.00	5.23	0.00	0.00
Naphthalene	15.26	0.00	15.26	0.00	0.00
Tetrachloroethylene	0.37	0.00	0.37	0.00	0.00
Toluene	130.82	0.00	130.82	0.00	0.00
Trichlorobenzene,1,2,4-	0.14	0.00	0.14	0.00	0.00
Trichloroethylene	5.18	0.00	5.18	0.00	0.00
Vinyl chloride (chloroethene)	0.35	0.00	0.35	0.00	0.00
Xylene,m- (1,3-xylene)	4.91	0.00	4.91	0.00	0.00
TOTAL	2160.94	0.00	2160.94	0.00	0.00

Total Compound Summary for [E4] - Equalization					
	Infl (Proc) (g/d)	Mass Emit (g/d)	Mass WW (g/d)	Mass Sludge (g/d)	Mass Bio/Destr (g/d)
Acetone	446.98	413.77	33.21	0.00	0.00
Benzene	1308.24	1303.44	4.80	0.00	0.00
Chlorobenzene	1.53	1.52	6.101e-03	0.00	0.00
Chloroethane (ethyl chloride)	1.14	1.14	3.607e-03	0.00	0.00
Chloroform (trichloromethane)	0.40	0.40	1.554e-03	0.00	0.00
Chloronaphthalene,2-	1.25	1.24	0.02	0.00	0.00
Dichlorobenzene,1,2-	0.65	0.65	3.306e-03	0.00	0.00
Dichlorobenzene,1,4-	0.46	0.46	1.917e-03	0.00	0.00
Dichloroethane,1,2- (ethylene dichloride)	1.14	1.14	6.307e-03	0.00	0.00
Dichloroethylene,1,1- (vinylidene chloride)	0.52	0.52	1.646e-03	0.00	0.00
Dichloroethylene,1,2,cis	1.42	1.41	5.074e-03	0.00	0.00
Methyl ethyl ketone (2-butanone)	11.45	11.30	0.15	0.00	0.00
Methyl tert-butyl ether	223.49	221.57	1.92	0.00	0.00
Methyl-2-pentanone,4- (methyl isobutyl ketone)	5.23	5.19	0.04	0.00	0.00
Naphthalene	15.26	15.11	0.15	0.00	0.00
Tetrachloroethylene	0.37	0.36	1.277e-03	0.00	0.00
Toluene	130.82	130.33	0.49	0.00	0.00
Trichlorobenzene,1,2,4-	0.14	0.14	6.971e-04	0.00	0.00
Trichloroethylene	5.18	5.16	0.02	0.00	0.00
Vinyl chloride (chloroethene)	0.35	0.35	1.077e-03	0.00	0.00
Xylene,m- (1,3-xylene)	4.91	4.89	0.02	0.00	0.00
TOTAL	2160.94	2120.09	40.85	0.00	0.00

V3 Report

ISRT - Class A Groundwater



Input Parameters Site Information for ISRT - Class A Groundwater	
	Data Entry Value
Elevation (m)	100.00
Ambient Air Temperature (deg C)	15.00
Wind Speed (km/h)	10.00

Input Parameters for [B4] - Influent	
	Data Entry Value
Wastewater Flow Rate (m3/d)	545.10
Suspended Solids (mg/L)	10.00
Volatile SS Ratio (%)	0.00
Oil/Grease Concentration (mg/L)	0.00
Temperature (deg C)	15.00

V3 Report

Input Parameters for [E4] - Equalization	
	Data Entry Value
Depth (m)	3.05
Surface Area (m2)	9.29
Number of CSTRs	1
Air Flow Rate (m3/h)	0.00
Oxygen Transfer Efficiency (%)	6.00
Total Mixer Power (kW)	100.00
Standard Oxygen Transfer Rate (kgO2/kWh)	1.80
Dirty/Clean Water Correction	0.80
Covered	No
Ventilation Rate (m3/h)	100.00

Total Concentrations Site Information for ISRT - Class A Groundwater		
	CI Eff (ug/L)	Ct Eff (ug/L)
Methyl tert-butyl ether	N/A	N/A
TOTAL	0.00	0.00

Total Concentrations for [B4] - Influent		
	CI Eff (ug/L)	Ct Eff (ug/L)
Methyl tert-butyl ether	0.73	0.73
TOTAL	0.73	0.73

Total Concentrations for [E4] - Equalization		
	CI Eff (ug/L)	Ct Eff (ug/L)
Methyl tert-butyl ether	6.263e-03	6.263e-03
TOTAL	6.263e-03	6.263e-03

Emissions Summary for Methyl tert-butyl ether				
	Ct Eff (ug/L)	Mass Emit (g/d)	Emit (%)	Mass WW (g/d)
Entire Plant	N/A	0.39	99.14	3.414e-03
[B4] Influent	0.73	0.00	0.00	0.40
[E4] Equalization	6.263e-03	0.39	99.14	3.414e-03

Total Compound Summary Site Information for ISRT - Class A Groundwater					
	Infl (Proc) (g/d)	Mass Emit (g/d)	Mass WW (g/d)	Mass Sludge (g/d)	Mass Bio/Destr (g/d)
Methyl tert-butyl ether	0.40	0.39	3.414e-03	0.00	0.00
TOTAL	0.40	0.39	3.414e-03	0.00	0.00

Total Compound Summary for [B4] - Influent					
	Infl (Proc) (g/d)	Mass Emit (g/d)	Mass WW (g/d)	Mass Sludge (g/d)	Mass Bio/Destr (g/d)
Methyl tert-butyl ether	0.40	0.00	0.40	0.00	0.00
TOTAL	0.40	0.00	0.40	0.00	0.00

Total Compound Summary for [E4] - Equalization					
	Infl (Proc) (g/d)	Mass Emit (g/d)	Mass WW (g/d)	Mass Sludge (g/d)	Mass Bio/Destr (g/d)
Methyl tert-butyl ether	0.40	0.39	3.414e-03	0.00	0.00
TOTAL	0.40	0.39	3.414e-03	0.00	0.00

Description

A potential future use of site groundwater is as process water in an industrial facility. Conservative assumptions on water use rates, process tank dimensions/characteristics, and building ventilation rate must be made. Following assumption generation, the water fate model, Toxchem+, is used to estimate contaminant flux rates from the water to the building air. These flux rates are converted to indoor air concentrations using the assumptions noted above.

Assumptions

Groundwater Influent Rate: 100 gpm = 0.144 MGD

Tank Size: width: 10 ft
(Mixed Tank) length: 10 ft
depth: 10 ft

Building Ventilation Rate: 5000 cfm 203904 m³/d [divide g/d by vent. rate to get indoor air concentration]

Results from Toxchem+ for 95% UCL influent concentrations

		<u>g/d</u>	<u>ug/m³</u>
Study Area Groundwater:	1,1-Dichloroethene	0.52	2.6
	1,2,4-Trichlorobenzene	0.14	0.69
	1,2-Dichlorobenzene	0.65	3.2
	1,2-Dichloroethane	1.1	5.6
	1,4-Dichlorobenzene	0.46	2.3
	2-Butanone	11	55
	4-Methyl-2-Pentanone	5.2	25
	Acetone	414	2029
	Benzene	1303	6392
	Chlorobenzene	1.5	7.5
	Chloroethane	1.1	5.6
	Chloroform	0.40	2.0
	cis-1,2-Dichloroethene	1.4	6.9
	Methyl tert-Butyl Ether	222	1087
	Tetrachloroethene	0.36	1.8
	Toluene	130	639
	Trichloroethene	5.2	25
	Vinyl Chloride	0.35	1.7
	Xylene, total	4.9	24
	2-Chloronaphthalene	1.2	6.1
	Naphthalene	15	74
Class A Groundwater:	Methyl tert-Butyl Ether	0.39	1.9

METCALF & EDDY

**COMMERCIAL WORKER
(Soil Gas)**

TABLE 4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current
Medium: Soil gas
Exposure Medium: Indoor Air

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	
ABC Roofing	95-63-6	1,2,4-Trimethylbenzene	14	1.4E+01	ug/m3	ABC Roofing	1 / 1	N/A	
	108-67-8	1,3,5-Trimethylbenzene	4.9	4.9E+00	ug/m3	ABC Roofing	1 / 1	N/A	
	622-96-8	4-Ethyltoluene	16	1.6E+01	ug/m3	ABC Roofing	1 / 1	N/A	
	67-64-1	Acetone	180 J	1.8E+02 J	ug/m3	ABC Roofing	1 / 1	N/A	
	71-43-2	Benzene	2.2	2.2E+00	ug/m3	ABC Roofing	1 / 1	N/A	
	74-87-3	Chloromethane	1.4	1.4E+00	ug/m3	ABC Roofing	1 / 1	N/A	
	75-71-8	Dichlorodifluoromethane	3.8	3.8E+00	ug/m3	ABC Roofing	1 / 1	N/A	
	100-41-4	Ethylbenzene	10	1.0E+01	ug/m3	ABC Roofing	1 / 1	N/A	
	75-09-2	Methylene Chloride	9	9.0E+00	ug/m3	ABC Roofing	1 / 1	N/A	
	142-82-5	n-Heptane	3.5	3.5E+00	ug/m3	ABC Roofing	1 / 1	N/A	
	110-54-3	n-Hexane	16	1.6E+01	ug/m3	ABC Roofing	1 / 1	N/A	
	127-18-4	Tetrachloroethene	5.2	5.2E+00	ug/m3	ABC Roofing	1 / 1	N/A	
	108-88-3	Toluene	17	1.7E+01	ug/m3	ABC Roofing	1 / 1	N/A	
	103-38-3/106-42	Xylene, m/p-	33	3.3E+01	ug/m3	ABC Roofing	1 / 1	N/A	
	95-47-6	Xylene, o-	8.7	8.7E+00	ug/m3	ABC Roofing	1 / 1	N/A	
Ganglani	95-63-6	1,2,4-Trimethylbenzene	8.8	8.8E+00	ug/m3	Ganglani	1 / 1	N/A	
	108-67-8	1,3,5-Trimethylbenzene	2.9	2.9E+00	ug/m3	Ganglani	1 / 1	N/A	
	622-96-8	4-Ethyltoluene	7.9	7.9E+00	ug/m3	Ganglani	1 / 1	N/A	
	67-64-1	Acetone	38	3.8E+01	ug/m3	Ganglani	1 / 1	N/A	
	74-87-3	Chloromethane	1.5	1.5E+00	ug/m3	Ganglani	1 / 1	N/A	
	75-71-8	Dichlorodifluoromethane	120	1.2E+02	ug/m3	Ganglani	1 / 1	N/A	
	100-41-4	Ethylbenzene	13	1.3E+01	ug/m3	Ganglani	1 / 1	N/A	
	67-63-0	Isopropyl Alcohol	17	1.7E+01	ug/m3	Ganglani	1 / 1	N/A	
	110-54-3	n-Hexane	3.4	3.4E+00	ug/m3	Ganglani	1 / 1	N/A	
	108-88-3	Toluene	14	1.4E+01	ug/m3	Ganglani	1 / 1	N/A	
	75-69-4	Trichlorofluoromethane	2.9	2.9E+00	ug/m3	Ganglani	1 / 1	N/A	
	103-38-3/106-42	Xylene, m/p-	48	4.8E+01	ug/m3	Ganglani	1 / 1	N/A	
	95-47-6	Xylene, o-	12	1.2E+01	ug/m3	Ganglani	1 / 1	N/A	
	Graphique	106-99-0	1,3-Butadiene	2.4	2.4E+00	ug/m3	Graphique	1 / 1	N/A
		67-64-1	Acetone	20	2.0E+01	ug/m3	Graphique	1 / 1	N/A
71-43-2		Benzene	2.4	2.4E+00	ug/m3	Graphique	1 / 1	N/A	
74-87-3		Chloromethane	1.2	1.2E+00	ug/m3	Graphique	1 / 1	N/A	
75-71-8		Dichlorodifluoromethane	4.1	4.1E+00	ug/m3	Graphique	1 / 1	N/A	
108-88-3		Toluene	4.1	4.1E+00	ug/m3	Graphique	1 / 1	N/A	
103-38-3/106-42		Xylene, m/p-	3.1	3.1E+00	ug/m3	Graphique	1 / 1	N/A	

TABLE 4
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
 INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current
 Medium: Soil gas
 Exposure Medium: Indoor Air

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits
Pacer	106-99-0	1,3-Butadiene	20	2.0E+01	ug/m3	Pacer	1 / 1	N/A
	78-93-3	2-Butanone	120	1.2E+02	ug/m3	Pacer	1 / 1	N/A
	67-64-1	Acetone	210 J	2.1E+02 J	ug/m3	Pacer	1 / 1	N/A
	71-43-2	Benzene	18	1.8E+01	ug/m3	Pacer	1 / 1	N/A
	75-15-0	Carbon Disulfide	3.1	3.1E+00	ug/m3	Pacer	1 / 1	N/A
	74-87-3	Chloromethane	1.2	1.2E+00	ug/m3	Pacer	1 / 1	N/A
	110-82-7	Cyclohexane	2.4	2.4E+00	ug/m3	Pacer	1 / 1	N/A
	75-71-8	Dichlorodifluoromethane	3.8	3.8E+00	ug/m3	Pacer	1 / 1	N/A
	100-41-4	Ethylbenzene	4.2	4.2E+00	ug/m3	Pacer	1 / 1	N/A
	1634-04-4	Methyl tert-Butyl Ether	4.7	4.7E+00	ug/m3	Pacer	1 / 1	N/A
	142-82-5	n-Heptane	11	1.1E+01	ug/m3	Pacer	1 / 1	N/A
	110-54-3	n-Hexane	13	1.3E+01	ug/m3	Pacer	1 / 1	N/A
	108-88-3	Toluene	26	2.6E+01	ug/m3	Pacer	1 / 1	N/A
	103-38-3/106-42	Xylene, m/p-	11	1.1E+01	ug/m3	Pacer	1 / 1	N/A
95-47-6	Xylene, o-	3.6	3.6E+00	ug/m3	Pacer	1 / 1	N/A	
Sacco	95-63-6	1,2,4-Trimethylbenzene	3.3	3.3E+00	ug/m3	Sacco/B	1 / 2	2.5
	106-99-0	1,3-Butadiene	3.1	3.1E+00	ug/m3	Sacco/B	1 / 2	1.1
	622-96-8	4-Ethyltoluene	2.5	2.5E+00	ug/m3	Sacco/B	1 / 2	2.5
	67-64-1	Acetone	48	4.8E+01	ug/m3	Sacco/B	1 / 2	12
	71-43-2	Benzene	2.4	2.4E+00	ug/m3	Sacco/B	1 / 2	1.6
	75-15-0	Carbon Disulfide	3.4	3.4E+00	ug/m3	Sacco/B	1 / 2	1.6
	67-66-3	Chloroform	2.5	2.5E+00	ug/m3	Sacco/B	1 / 2	2.4
	74-87-3	Chloromethane	1.4	1.4E+00	ug/m3	Sacco/A	1 / 2	1
	75-71-8	Dichlorodifluoromethane	3.7	4.0E+00	ug/m3	Sacco/B	2 / 2	N/A
	100-41-4	Ethylbenzene	2.6	2.6E+00	ug/m3	Sacco/B	1 / 2	2.2
	110-54-3	n-Hexane	2	2.0E+00	ug/m3	Sacco/B	1 / 2	1.8
	108-88-3	Toluene	7.9	7.9E+00	ug/m3	Sacco/B	1 / 2	1.9
	103-38-3/106-42	Xylene, m/p-	7.8	7.8E+00	ug/m3	Sacco/B	1 / 2	2.2
	95-47-6	Xylene, o-	2.7	2.7E+00	ug/m3	Sacco/B	1 / 2	2.2

TABLE 4
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
 INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Current
 Medium: Soil gas
 Exposure Medium: Indoor Air

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits
Teradyne	95-63-6	1,2,4-Trimethylbenzene	3.35	3.4E+00	ug/m3	Teradyne	1 / 1	N/A
	78-93-3	2-Butanone	5.9 J	5.9E+00 J	ug/m3	Teradyne	1 / 1	N/A
	622-96-8	4-Ethyltoluene	2.6	2.6E+00	ug/m3	Teradyne	1 / 1	N/A
	67-64-1	Acetone	78.5 J	7.9E+01 J	ug/m3	Teradyne	1 / 1	N/A
	71-43-2	Benzene	2.6 J	2.6E+00 J	ug/m3	Teradyne	1 / 1	N/A
	75-15-0	Carbon Disulfide	4.65 J	4.7E+00 J	ug/m3	Teradyne	1 / 1	N/A
	75-00-3	Chloroethane	1.55 J	1.6E+00 J	ug/m3	Teradyne	1 / 1	N/A
	74-87-3	Chloromethane	1.3 J	1.3E+00 J	ug/m3	Teradyne	1 / 1	N/A
	110-82-7	Cyclohexane	5.9 J	5.9E+00 J	ug/m3	Teradyne	1 / 1	N/A
	75-71-8	Dichlorodifluoromethane	3 J	3.0E+00 J	ug/m3	Teradyne	1 / 1	N/A
	100-41-4	Ethylbenzene	5.2	5.2E+00	ug/m3	Teradyne	1 / 1	N/A
	67-63-0	Isopropyl Alcohol	75 J	7.5E+01 J	ug/m3	Teradyne	1 / 1	N/A
	75-09-2	Methylene Chloride	1.325 J	1.3E+00 J	ug/m3	Teradyne	1 / 1	N/A
	142-82-5	n-Heptane	32.5	3.3E+01	ug/m3	Teradyne	1 / 1	N/A
	110-54-3	n-Hexane	6.5 J	6.5E+00 J	ug/m3	Teradyne	1 / 1	N/A
	100-42-5	Styrene	6.85	6.9E+00	ug/m3	Teradyne	1 / 1	N/A
	108-88-3	Toluene	25.5	2.6E+01	ug/m3	Teradyne	1 / 1	N/A
	79-01-6	Trichloroethene	24.5 J	2.5E+01 J	ug/m3	Teradyne	1 / 1	N/A
75-69-4	Trichlorofluoromethane	46 J	4.6E+01 J	ug/m3	Teradyne	1 / 1	N/A	
103-38-3/106-42	Xylene, m/p-	20	2.0E+01	ug/m3	Teradyne	1 / 1	N/A	
95-47-6	Xylene, o-	6.1	6.1E+00	ug/m3	Teradyne	1 / 1	N/A	
Vining	67-64-1	Acetone	12	1.2E+01	ug/m3	Vining	1 / 1	N/A
	74-87-3	Chloromethane	1.3	1.3E+00	ug/m3	Vining	1 / 1	N/A
	75-71-8	Dichlorodifluoromethane	4.4	4.4E+00	ug/m3	Vining	1 / 1	N/A
	75-09-2	Methylene Chloride	20	2.0E+01	ug/m3	Vining	1 / 1	N/A
	110-54-3	n-Hexane	14	1.4E+01	ug/m3	Vining	1 / 1	N/A
	108-88-3	Toluene	2.3	2.3E+00	ug/m3	Vining	1 / 1	N/A
	75-69-4	Trichlorofluoromethane	4.3	4.3E+00	ug/m3	Vining	1 / 1	N/A

Notes:

All contaminants detected in soil gas sampling have been included.

**TABLE 5
SOILGAS TO INDOOR AIR
ABC ROOFING**

	Soil EPC	Soil Temp.	Soil Temp.	Henry's Law Constant	Henry's Law Reference	Normal Boiling Point	Enthalpy of vaporization	Critical Temp.	Enthalpy of vaporization	Gas Constant	Henry's Law Constant	Gas Constant	Henry's Law Constant	
	C_R	T_S	T'_S	at ref. temp.	Temp.	Point	at T_S	Temp.	at T_S	Constant	at T_S	Constant	Constant	
Units:	$\mu\text{g}/\text{kg}$	$^{\circ}\text{C}$	K	$\text{atm}\cdot\text{m}^3/\text{mol}$	K	K	cal/mol	K	cal/mol	cal/mol-K	$\text{atm}\cdot\text{m}^3/\text{mol}$	$\text{m}^3\cdot\text{atm}/\text{mol}\cdot\text{K}$	unitless	
Formula:	Input	(10 for screening)	($T_S + 273.15$)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)	(Note 9)		$H_{TS} / (R * T_S)$	
Analyte														
1,2,4-Trimethylbenzene	Not used	1.00E+01	2.83E+02	6.16E-03	2.98E+02	NA	NA	NA	NA	1.99E+00	6.16E-03	8.21E-05	2.65E-01	
1,3,5-Trimethylbenzene	Not used	1.00E+01	2.83E+02	5.88E-03	2.98E+02	NA	NA	NA	NA	1.99E+00	5.88E-03	8.21E-05	2.53E-01	
4-Ethyltoluene	Not used	1.00E+01	2.83E+02	5.00E-03	2.98E+02	NA	NA	NA	NA	1.99E+00	5.00E-03	8.21E-05	2.15E-01	
Acetone	Not used	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	1.97E-05	8.21E-05	8.50E-04
Benzene	Not used	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	2.68E-03	8.21E-05	1.16E-01
Chloromethane	Not used	1.00E+01	2.83E+02	8.21E-03	2.98E+02	NA	NA	NA	NA	1.99E+00	8.21E-03	8.21E-05	3.53E-01	
Dichlorodifluoromethane	Not used	1.00E+01	2.83E+02	3.90E-01	2.98E+02	NA	NA	NA	NA	1.99E+00	3.90E-01	8.21E-05	1.68E+01	
Ethylbenzene	Not used	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	3.18E-03	8.21E-05	1.37E-01
Methylene Chloride	Not used	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	1.17E-03	8.21E-05	5.03E-02
n-Heptane	Not used	1.00E+01	2.83E+02	2.70E+00	2.98E+02	NA	NA	NA	NA	1.99E+00	2.70E+00	8.21E-05	1.16E+02	
n-Hexane	Not used	1.00E+01	2.83E+02	1.67E+00	2.98E+02	NA	NA	NA	NA	1.99E+00	1.67E+00	8.21E-05	7.17E+01	
Tetrachloroethene	Not used	1.00E+01	2.83E+02	1.84E-02	2.98E+02	3.94E+02	8.29E+03	6.20E+02	3.55E-01	9.55E+03	1.99E+00	7.83E-03	8.21E-05	3.37E-01
Toluene	Not used	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	2.93E-03	8.21E-05	1.26E-01
Xylene, m/p-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01
Xylene, o-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01

TABLE 5 (continued)
SOILGAS TO INDOOR AIR
ABC ROOFING

	Conversion Factor $\mu\text{g}/\text{kg}$ to g/g Conv01 Units: $\mu\text{g}/\text{kg}$ / g/g Formula:	SCS soil type in vadose zone ST _v unitless (Note 11)	Vadose zone soil dry bulk density ρ_b g/cm^3 (1.5 for screening)	Vadose zone soil water-filled porosity $\theta_{w,v}$ cm^3/cm^3 (0.3 for screening)	Organic carbon partition coefficient K _{oc} cm^3/g lookup not used	Vadose zone organic carbon fraction f _{oc,v} unitless (0.002 for screening) not used	Soil-water partition coefficient K _d cm^3/g K _{oc} * f _{oc} not used	Vadose zone soil total porosity n _v cm^3/cm^3 (0.43 for screening)	Vadose zone soil air-filled porosity $\theta_{a,v}$ cm^3/cm^3 n _v - $\theta_{w,v}$	Conversion Factor g/cm^3 to $\mu\text{g}/\text{m}^3$ Conv03 g/cm^3 / $\mu\text{g}/\text{m}^3$	Source Vapor Conc. C _{source} $\mu\text{g}/\text{m}^3$ (Input)
Analyte											
1,2,4-Trimethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	3.70E+03	2.00E-03	7.41E+00	4.30E-01	1.30E-01	1.00E+12	1.40E+01
1,3,5-Trimethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	8.55E+03	2.00E-03	1.71E+01	4.30E-01	1.30E-01	1.00E+12	4.90E+00
4-Ethyltoluene	1.00E-09	SCL	1.50E+00	3.00E-01	5.12E+03	2.00E-03	1.02E+01	4.30E-01	1.30E-01	1.00E+12	1.60E+01
Acetone	1.00E-09	SCL	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	1.80E+02
Benzene	1.00E-09	SCL	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	2.20E+00
Chloromethane	1.00E-09	SCL	1.50E+00	3.00E-01	7.72E+01	2.00E-03	1.54E-01	4.30E-01	1.30E-01	1.00E+12	1.40E+00
Dichlorodifluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.63E+02	2.00E-03	7.26E-01	4.30E-01	1.30E-01	1.00E+12	3.80E+00
Ethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	1.00E+01
Methylene Chloride	1.00E-09	SCL	1.50E+00	3.00E-01	1.17E+01	2.00E-03	2.34E-02	4.30E-01	1.30E-01	1.00E+12	9.00E+00
n-Heptane	1.00E-09	SCL	1.50E+00	3.00E-01	1.28E+03	2.00E-03	2.57E+00	4.30E-01	1.30E-01	1.00E+12	3.50E+00
n-Hexane	1.00E-09	SCL	1.50E+00	3.00E-01	4.80E+02	2.00E-03	9.61E-01	4.30E-01	1.30E-01	1.00E+12	1.60E+01
Tetrachloroethene	1.00E-09	SCL	1.50E+00	3.00E-01	2.65E+02	2.00E-03	5.30E-01	4.30E-01	1.30E-01	1.00E+12	5.20E+00
Toluene	1.00E-09	SCL	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	1.70E+01
Xylene, m/p-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	3.30E+01
Xylene, o-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	8.70E+00

TABLE 5 (continued)
SOILGAS TO INDOOR AIR
ABC ROOFING

	Depth below grade to bottom of enclosed space L_F	Depth below grade to contamination L_t	Source Building Separation L_T	Diffusivity in air D_a	Diffusivity in water D_w	Vadose zone Effective Diffusion Coeff. D_v^{eff}	Total Overall Effective Diffusion Coeff. D_T^{eff}	Area of Enclosed Space Below Grade A_B	Building Ventilation Rate $Q_{building}$	Pressure Diff. between soil & enclosed space ΔP	Vadose zone soil saturated hydraulic conductivity $K_{s,v}$
Units:	cm	cm	cm	cm ² /s	cm ² /s	cm ² /s	cm ² /s	cm ²	cm ³ /s	g/cm-s ²	cm/hr
Formula:	(15 or 200 for screening)	(400 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(56335 for screening)	(40 for screening)	lookup
Analyte											
1,2,4-Trimethylbenzene	2.00E+02	4.00E+02	2.00E+02	6.02E-02	8.67E-06	3.68E-04	3.68E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
1,3,5-Trimethylbenzene	2.00E+02	4.00E+02	2.00E+02	6.02E-02	8.67E-06	3.68E-04	3.68E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
4-Ethyltoluene	2.00E+02	4.00E+02	2.00E+02	6.49E-02	7.84E-06	3.97E-04	3.97E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Acetone	2.00E+02	4.00E+02	2.00E+02	1.24E-01	1.14E-05	2.07E-03	2.07E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Benzene	2.00E+02	4.00E+02	2.00E+02	8.80E-02	9.80E-06	5.42E-04	5.42E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Chloromethane	2.00E+02	4.00E+02	2.00E+02	1.26E-01	6.50E-06	7.65E-04	7.65E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Dichlorodifluoromethane	2.00E+02	4.00E+02	2.00E+02	6.65E-02	9.92E-06	4.03E-04	4.03E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Ethylbenzene	2.00E+02	4.00E+02	2.00E+02	7.50E-02	7.80E-06	4.60E-04	4.60E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Methylene Chloride	2.00E+02	4.00E+02	2.00E+02	1.01E-01	1.17E-05	6.35E-04	6.35E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
n-Heptane	2.00E+02	4.00E+02	2.00E+02	9.26E-02	7.59E-06	5.61E-04	5.61E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
n-Hexane	2.00E+02	4.00E+02	2.00E+02	2.00E-01	7.77E-06	1.21E-03	1.21E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Tetrachloroethene	2.00E+02	4.00E+02	2.00E+02	7.20E-02	8.20E-06	4.39E-04	4.39E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Toluene	2.00E+02	4.00E+02	2.00E+02	8.70E-02	8.60E-06	5.34E-04	5.34E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Xylene, m/p-	2.00E+02	4.00E+02	2.00E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Xylene, o-	2.00E+02	4.00E+02	2.00E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01

TABLE 5 (continued)
SOILGAS TO INDOOR AIR
ABC ROOFING

	Conversion Factor hr to s Conv02 Units: Formula:	Viscosity of water at 10°C μ_{w-10} g/cm-s	Viscosity of water at system temp. μ_w g/cm-s (Note 16)	Density of water ρ_w g/cm ³ (0.999 for screening)	Acceleration due to gravity g cm/s ²	Vadose zone soil intrinsic permeability $k_{i,v}$ cm ² (Note 17)	Vadose zone residual soil water content $\theta_{r,v}$ cm ³ /cm ³ lookup	Vadose zone effective total fluid saturation S_{te} unitless (Note 18)	Vadose zone van Genuchten shape parameter M_v unitless lookup	Vadose zone soil relative air permeability k_{rg} unitless (Note 19)	Vadose zone soil effective vapor permeability k_v cm ² (Note 20)
Analyte											
1,2,4-Trimethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
1,3,5-Trimethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
4-Ethyltoluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Acetone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Benzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Dichlorodifluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Ethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Methylene Chloride	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Heptane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Hexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Tetrachloroethene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Toluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, m/p-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, o-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09

TABLE 5 (continued)
SOILGAS TO INDOOR AIR
ABC ROOFING

	Floor-wall seam perimeter X_{crack}	Vapor viscosity at avg. soil temp. μ_{TS}	Crack depth below grade Z_{crack}	Total area of cracks A_{crack}	Crack-to-total area ratio η	Equivalent crack radius r_{crack}	Avg. Vapor Flow Rate Into Bldg. Q_{soil}	Foundation or Slab Thickness L_{crack}	Crack Effective Diffusion Coeff. D^{crack}	Infinite Source Indoor Attenuation Coeff. α	Infinite Source Bldg. Conc. $C_{building}$
Units:	cm	g/cm-s	cm	cm ²	unitless	cm	cm ³ /s	cm	cm ² /s	unitless	μg/m ³
Formula:	(3844 for screening)	$0.00018*(T_s/298.15)^{0.5}$	(= L_F for screening)	(384 for screening)	A_{crack}/A_B	$\eta(A_B/X_{crack})$	(Note 5)	(15 for screening)	(Note 1)	(Note 6)	$C_{source} * \alpha$
Analyte											
1,2,4-Trimethylbenzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	3.68E-04	1.05E-05	1.48E-04
1,3,5-Trimethylbenzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	3.68E-04	1.05E-05	5.16E-05
4-Ethyltoluene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	3.97E-04	1.07E-05	1.71E-04
Acetone	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	2.07E-03	1.25E-05	2.25E-03
Benzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.42E-04	1.12E-05	2.47E-05
Chloromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	7.65E-04	1.17E-05	1.64E-05
Dichlorodifluoromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.03E-04	1.07E-05	4.07E-05
Ethylbenzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.60E-04	1.10E-05	1.10E-04
Methylene Chloride	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	6.35E-04	1.15E-05	1.03E-04
n-Heptane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.61E-04	1.13E-05	3.95E-05
n-Hexane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	1.21E-03	1.22E-05	1.94E-04
Tetrachloroethene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.39E-04	1.09E-05	5.65E-05
Toluene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.34E-04	1.12E-05	1.90E-04
Xylene, m/p-	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.73E-04	1.10E-05	3.63E-04
Xylene, o-	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.73E-04	1.10E-05	9.57E-05

TABLE 5 (continued)
SOILGAS TO INDOOR AIR
ABC ROOFING

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- (1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- (2) For screening, $A_B = 923,521 \text{ cm}^2$ for $L_F = 15 \text{ cm}$ and $A_B = 1,692,321 \text{ cm}^2$ for $L_F = 200 \text{ cm}$
- (3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.
- (4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$
- (5) $Q_{soil} = (2 * \pi * \Delta P * k_v * X_{crack}) / (\mu_{TS} * \ln(2 * Z_{crack} / r_{crack}))$
- (6) $\alpha = [(D_T^{eff} * A_B / (Q_{building} * L_T)) * \text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack}))] / [\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) + (D_T^{eff} * A_B / (Q_{building} * L_T)) + (D_T^{eff} * A_B / (Q_{soil} * L_T)) * (\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) - 1)]$
- (7) A function of the ratio T_B/T_C :

T_B/T_C	α
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C) - 0.116$
>0.71	0.41
- (8) $\Delta H_{v,TS} = \Delta H_{v,B} * [(1 - T_S/T_C) / (1 - T_B/T_C)]^n$
- (9) $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_c * (1/T_S - 1/T_R)] * H_R$; or taken from lookup table.
- (10) Refer to 12 SCS soil types - use SC for screening.
- (11) Refer to 12 SCS soil types - use SCL for screening.
- (12) $L_{cz} = 0.15 / (0.2 * D_{cz})$
- (13) $D_v^{eff} = D_a * (\theta_{av}^{3.33} / n_v^2) + (D_w / H'_{TS}) * (\theta_{wv}^{3.33} / n_v^2)$
- (14) $D_{cz}^{eff} = D_a * (\theta_{acz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS}) * (\theta_{wcz}^{3.33} / n_{cz}^2)$
- (15) $\theta_{wcz} = \theta_{rcz} + ((\theta_{scz} - \theta_{rcz}) / (2^{M_{cz}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- (16) $\mu_w = \mu_{w-10} * (T'_S / 283.15)^{0.5}$
- (17) $k_{i,v} = K_{s,v} * 1 / \text{Conv}02 * \mu_w / (\rho_w * g)$
- (18) $S_{ie} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$
- (19) $k_{rg} = (1 - S_{ie})^{1.5} * (1 - S_{ie}^{1/MV})^{2MV}$
- (20) $k_v = k_{i,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- (21) $C_{source} = H'_{TS} * C_R * \text{Conv}01 * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * \text{Conv}02$

**TABLE 6
SOILGAS TO OUTDOOR AIR
ABC ROOFING**

	Soil EPC	Soil Temp.	Soil Temp.	Henry's Law Constant at ref. temp.	Henry's Law Reference Temp.	Normal Boiling Point	Enthalpy of vaporization at T _S	Critical Temp.	Enthalpy of vaporization constant	Enthalpy of vaporization at T _S	Gas Constant	Henry's Law Constant at T _S	Gas Constant	Henry's Law Constant
	C _R	T _S	T' _S	H _R	T _R	T _B	ΔH _{v,B}	T _C	n	ΔH _{v,T_S}	R _c	H _{T_S}	R	H' _{T_S}
Units:	μg/kg	°C	K	atm·m ³ /mol	K	K	cal/mol	K	unitless	cal/mol	cal/mol-K	atm·m ³ /mol	m ³ ·atm/mol-K	unitless
Formula:	Input	(10 for screening)	(T _S +273.15)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)		(Note 9)		H _{T_S} / (R * T' _S)
Analyte														
1,2,4-Trimethylbenzene	Not used	1.00E+01	2.83E+02	6.16E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	6.16E-03	8.21E-05	2.65E-01
1,3,5-Trimethylbenzene	Not used	1.00E+01	2.83E+02	5.88E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	5.88E-03	8.21E-05	2.53E-01
4-Ethyltoluene	Not used	1.00E+01	2.83E+02	5.00E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	5.00E-03	8.21E-05	2.15E-01
Acetone	Not used	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	1.97E-05	8.21E-05	8.50E-04
Benzene	Not used	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	2.68E-03	8.21E-05	1.16E-01
Chloromethane	Not used	1.00E+01	2.83E+02	8.21E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	8.21E-03	8.21E-05	3.53E-01
Dichlorodifluoromethane	Not used	1.00E+01	2.83E+02	3.90E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	3.90E-01	8.21E-05	1.68E+01
Ethylbenzene	Not used	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	3.18E-03	8.21E-05	1.37E-01
Methylene Chloride	Not used	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	1.17E-03	8.21E-05	5.03E-02
n-Heptane	Not used	1.00E+01	2.83E+02	2.70E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	2.70E+00	8.21E-05	1.16E+02
n-Hexane	Not used	1.00E+01	2.83E+02	1.67E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.67E+00	8.21E-05	7.17E+01
Tetrachloroethene	Not used	1.00E+01	2.83E+02	1.84E-02	2.98E+02	3.94E+02	8.29E+03	6.20E+02	3.55E-01	9.55E+03	1.99E+00	7.83E-03	8.21E-05	3.37E-01
Toluene	Not used	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	2.93E-03	8.21E-05	1.26E-01
Xylene, m/p-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01
Xylene, o-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01

TABLE 6 (continued)
SOILGAS TO OUTDOOR AIR
ABC ROOFING

	Conversion Factor $\mu\text{g}/\text{kg}$ to g/g	SCS soil type in vadose zone	Vadose zone soil dry bulk density	Vadose zone soil water-filled porosity	Organic carbon partition coefficient	Vadose zone organic carbon fraction	Soil-water partition coefficient	Vadose zone soil total porosity	Vadose zone soil air-filled porosity	Conversion Factor g/cm^3 to $\mu\text{g}/\text{m}^3$	Source Vapor Conc. C_{source}
	Conv01	ST_v	ρ_b	$\theta_{w,v}$	K_{oc}	$f_{oc,v}$	K_d	n_v	$\theta_{a,v}$	Conv03	C_{source}
	Units: $\mu\text{g}/\text{kg}$ / g/g	unitless	g/cm^3	cm^3/cm^3	cm^3/g	unitless	cm^3/g	cm^3/cm^3	cm^3/cm^3	g/cm^3 / $\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
	Formula:	(Note 11)	(1.5 for screening)	(0.3 for screening)	lookup	(0.002 for screening)	$K_{oc} * f_{oc}$	(0.43 for screening)	$n_v - \theta_{w,v}$		(Input)
					not used	not used	not used				
Analyte											
1,2,4-Trimethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	3.70E+03	2.00E-03	7.41E+00	4.30E-01	1.30E-01	1.00E+12	1.40E+01
1,3,5-Trimethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	8.55E+03	2.00E-03	1.71E+01	4.30E-01	1.30E-01	1.00E+12	4.90E+00
4-Ethyltoluene	1.00E-09	SCL	1.50E+00	3.00E-01	5.12E+03	2.00E-03	1.02E+01	4.30E-01	1.30E-01	1.00E+12	1.60E+01
Acetone	1.00E-09	SCL	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	1.80E+02
Benzene	1.00E-09	SCL	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	2.20E+00
Chloromethane	1.00E-09	SCL	1.50E+00	3.00E-01	7.72E+01	2.00E-03	1.54E-01	4.30E-01	1.30E-01	1.00E+12	1.40E+00
Dichlorodifluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.63E+02	2.00E-03	7.26E-01	4.30E-01	1.30E-01	1.00E+12	3.80E+00
Ethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	1.00E+01
Methylene Chloride	1.00E-09	SCL	1.50E+00	3.00E-01	1.17E+01	2.00E-03	2.34E-02	4.30E-01	1.30E-01	1.00E+12	9.00E+00
n-Heptane	1.00E-09	SCL	1.50E+00	3.00E-01	1.28E+03	2.00E-03	2.57E+00	4.30E-01	1.30E-01	1.00E+12	3.50E+00
n-Hexane	1.00E-09	SCL	1.50E+00	3.00E-01	4.80E+02	2.00E-03	9.61E-01	4.30E-01	1.30E-01	1.00E+12	1.60E+01
Tetrachloroethene	1.00E-09	SCL	1.50E+00	3.00E-01	2.65E+02	2.00E-03	5.30E-01	4.30E-01	1.30E-01	1.00E+12	5.20E+00
Toluene	1.00E-09	SCL	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	1.70E+01
Xylene, m/p-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	3.30E+01
Xylene, o-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	8.70E+00

TABLE 6 (continued)
SOILGAS TO OUTDOOR AIR
ABC ROOFING

	Depth below grade to bottom of trench L_F	Depth below grade to contamination L_t	Source Trench Separation L_T	Diffusivity in air D_a	Diffusivity in water D_w	Vadose zone Effective Diffusion Coeff. D_v^{eff}	Total Overall Effective Diffusion Coeff. D_T^{eff}	Area of Trench Below Grade A_B	Trench Ventilation Rate Q_{trench}	Pressure Diff. between soil & enclosed space ΔP	Vadose zone soil saturated hydraulic conductivity $K_{s,v}$
Units:	cm	cm	cm	cm ² /s	cm ² /s	cm ² /s	cm ² /s	cm ²	cm ³ /s	g/cm-s ²	cm/hr
Formula:	(120 (4') for screening)	(400 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(Note 22)	(40 for screening)	lookup
Analyte											
1,2,4-Trimethylbenzene	1.20E+02	4.00E+02	2.80E+02	6.02E-02	8.67E-06	3.68E-04	3.68E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
1,3,5-Trimethylbenzene	1.20E+02	4.00E+02	2.80E+02	6.02E-02	8.67E-06	3.68E-04	3.68E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
4-Ethyltoluene	1.20E+02	4.00E+02	2.80E+02	6.49E-02	7.84E-06	3.97E-04	3.97E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Acetone	1.20E+02	4.00E+02	2.80E+02	1.24E-01	1.14E-05	2.07E-03	2.07E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Benzene	1.20E+02	4.00E+02	2.80E+02	8.80E-02	9.80E-06	5.42E-04	5.42E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Chloromethane	1.20E+02	4.00E+02	2.80E+02	1.26E-01	6.50E-06	7.65E-04	7.65E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Dichlorodifluoromethane	1.20E+02	4.00E+02	2.80E+02	6.65E-02	9.92E-06	4.03E-04	4.03E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Ethylbenzene	1.20E+02	4.00E+02	2.80E+02	7.50E-02	7.80E-06	4.60E-04	4.60E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Methylene Chloride	1.20E+02	4.00E+02	2.80E+02	1.01E-01	1.17E-05	6.35E-04	6.35E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
n-Heptane	1.20E+02	4.00E+02	2.80E+02	9.26E-02	7.59E-06	5.61E-04	5.61E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
n-Hexane	1.20E+02	4.00E+02	2.80E+02	2.00E-01	7.77E-06	1.21E-03	1.21E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Tetrachloroethene	1.20E+02	4.00E+02	2.80E+02	7.20E-02	8.20E-06	4.39E-04	4.39E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Toluene	1.20E+02	4.00E+02	2.80E+02	8.70E-02	8.60E-06	5.34E-04	5.34E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Xylene, m/p-	1.20E+02	4.00E+02	2.80E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Xylene, o-	1.20E+02	4.00E+02	2.80E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01

TABLE 6 (continued)
SOILGAS TO OUTDOOR AIR
ABC ROOFING

	Conversion Factor hr to s Conv02 Units: Formula:	Viscosity of water at 10°C μ_{w-10} g/cm-s	Viscosity of water at system temp. μ_w g/cm-s (Note 16)	Density of water ρ_w g/cm ³ (0.999 for screening)	Acceleration due to gravity g cm/s ²	Vadose zone soil intrinsic permeability $k_{i,v}$ cm ² (Note 17)	Vadose zone residual soil water content $\theta_{r,v}$ cm ³ /cm ³ lookup	Vadose zone effective total fluid saturation S_{te} unitless (Note 18)	Vadose zone van Genuchten shape parameter M_v unitless lookup	Vadose zone soil relative air permeability k_{rg} unitless (Note 19)	Vadose zone soil effective vapor permeability k_v cm ² (Note 20)
Analyte											
1,2,4-Trimethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
1,3,5-Trimethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
4-Ethyltoluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Acetone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Benzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Dichlorodifluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Ethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Methylene Chloride	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Heptane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Hexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Tetrachloroethene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Toluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, m/p-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, o-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09

TABLE 6 (continued)
SOILGAS TO OUTDOOR AIR
ABC ROOFING

	Thickness of soil between soilgas & trench	Vapor viscosity at avg. soil temp.	Avg. Vapor Flow Rate Into trench	Infinite Source Attenuation Coeff.	Infinite Source Trench Conc.
	L_{soil}	μ_{TS}	Q_{soil}	α	C_{trench}
Units:	cm	g/cm-s	cm ³ /s	unitless	µg/m ³
Formula:	(1 for screening)	$0.00018*(T_s/298.15)^{0.5}$	(Note 5)	(Note 6)	$C_{source} * \alpha$
Analyte					
1,2,4-Trimethylbenzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.07E-08
1,3,5-Trimethylbenzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	7.26E-09
4-Ethyltoluene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.37E-08
Acetone	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.67E-07
Benzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	3.26E-09
Chloromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.08E-09
Dichlorodifluoromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	5.63E-09
Ethylbenzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.48E-08
Methylene Chloride	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.33E-08
n-Heptane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	5.19E-09
n-Hexane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.37E-08
Tetrachloroethene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	7.71E-09
Toluene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.52E-08
Xylene, m/p-	1.00E+00	1.75E-04	2.52E-04	1.48E-09	4.89E-08
Xylene, o-	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.29E-08

TABLE 6 (continued)
SOILGAS TO OUTDOOR AIR
ABC ROOFING

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- (1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- (2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.
- (3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.
- (4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$
- (5) $Q_{soil} = (2 * \pi * \Delta P * k_v * X_{crack}) / (\mu_{TS} * \ln(2 * Z_{crack} / r_{crack}))$
- (6) $\alpha = [(D_T^{eff} * A_B / (Q_{building} * L_T)) * \text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack}))] / [\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) + (D_T^{eff} * A_B / (Q_{building} * L_T)) + (D_T^{eff} * A_B / (Q_{soil} * L_T)) * (\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) - 1)]$
- (7) A function of the ratio T_B/T_C :

T_B/T_C	α
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C) - 0.116$
>0.71	0.41
- (8) $\Delta H_{v,TS} = \Delta H_{v,B} * [(1 - T_S/T_C) / (1 - T_B/T_C)]^3$
- (9) $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_c * (1/T_S - 1/T_R)] * H_R$
- (10) Refer to 12 SCS soil types - use SC for screening.
- (11) Refer to 12 SCS soil types - use SCL for screening.
- (12) $L_{cz} = 0.15 / (0.2 * D_{cz})$
- (13) $D_v^{eff} = D_a * (\theta_{a,v}^{3.33} / n_v^2) + (D_w / H'_{TS}) * (\theta_{w,v}^{3.33} / n_v^2)$
- (14) $D_{cz}^{eff} = D_a * (\theta_{a,cz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS}) * (\theta_{w,cz}^{3.33} / n_{cz}^2)$
- (15) $\theta_{w,cz} = \theta_{r,cz} + ((\theta_{s,cz} - \theta_{r,cz}) / (2^{MCZ}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- (16) $\mu_w = \mu_{w-10} * (\Gamma'_S / 283.15)^{0.5}$
- (17) $k_{i,v} = K_{s,v} * 1/\text{Conv02} * \mu_w / (\rho_w * g)$
- (18) $S_{ie} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$
- (19) $k_{rg} = (1 - S_{ie})^{1.5} * (1 - S_{ie}^{1/MV})^{2MV}$
- (20) $k_v = k_{i,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- (21) $C_{source} = H'_{TS} * C_R * \text{Conv01} * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * \text{Conv02}$
- (22) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

**TABLE 7
SOILGAS TO INDOOR AIR
GANGLANI**

	Soil EPC	Soil Temp.	Soil Temp.	Henry's Law Constant	Henry's Law Reference	Normal Boiling Point	Enthalpy of vaporization	Critical Temp.	Enthalpy of vaporization	Gas Constant	Henry's Law Constant	Gas Constant	Henry's Law Constant	
	C_R	T_S	T'_S	at ref. temp.	Temp.	Point	at T_S	Temp.	constant	at T_S	at T_S	at T_S	at T_S	
Units:	$\mu\text{g}/\text{kg}$	$^{\circ}\text{C}$	K	$\text{atm}\cdot\text{m}^3/\text{mol}$	K	K	cal/mol	K	unitless	cal/mol	cal/mol-K	$\text{atm}\cdot\text{m}^3/\text{mol}$	$\text{m}^3\cdot\text{atm}/\text{mol}\cdot\text{K}$	unitless
Formula:	Input	(10 for screening)	($T_S + 273.15$)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)	(Note 9)			$H_{TS} / (R * T_S)$
Analyte														
1,2,4-Trimethylbenzene	Not used	1.00E+01	2.83E+02	6.16E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	6.16E-03	8.21E-05	2.65E-01
1,3,5-Trimethylbenzene	Not used	1.00E+01	2.83E+02	5.88E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	5.88E-03	8.21E-05	2.53E-01
4-Ethyltoluene	Not used	1.00E+01	2.83E+02	5.00E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	5.00E-03	8.21E-05	2.15E-01
Acetone	Not used	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	1.97E-05	8.21E-05	8.50E-04
Chloromethane	Not used	1.00E+01	2.83E+02	8.21E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	8.21E-03	8.21E-05	3.53E-01
Dichlorodifluoromethane	Not used	1.00E+01	2.83E+02	3.90E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	3.90E-01	8.21E-05	1.68E+01
Ethylbenzene	Not used	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	3.18E-03	8.21E-05	1.37E-01
Isopropyl Alcohol	Not used	1.00E+01	2.83E+02	7.69E-06	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.69E-06	8.21E-05	3.31E-04
n-Hexane	Not used	1.00E+01	2.83E+02	1.67E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.67E+00	8.21E-05	7.17E+01
Toluene	Not used	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	2.93E-03	8.21E-05	1.26E-01
Trichlorofluoromethane	Not used	1.00E+01	2.83E+02	1.00E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.00E-01	8.21E-05	4.30E+00
Xylene, m/p-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01
Xylene, o-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01

TABLE 7 (continued)
SOILGAS TO INDOOR AIR
GANGLANI

	Conversion Factor $\mu\text{g}/\text{kg}$ to g/g Conv01 Units: $\mu\text{g}/\text{kg}$ / g/g Formula:	SCS soil type in vadose zone ST_v unitless (Note 11)	Vadose zone soil dry bulk density ρ_b g/cm^3 (1.5 for screening)	Vadose zone soil water-filled porosity $\theta_{w,v}$ cm^3/cm^3 (0.3 for screening)	Organic carbon partition coefficient K_{oc} cm^3/g lookup not used	Vadose zone organic carbon fraction $f_{oc,v}$ unitless (0.002 for screening) not used	Soil-water partition coefficient K_d cm^3/g not used	Vadose zone soil total porosity n_v cm^3/cm^3 (0.43 for screening)	Vadose zone soil air-filled porosity $\theta_{a,v}$ cm^3/cm^3 $n_v - \theta_{w,v}$	Conversion Factor g/cm^3 to $\mu\text{g}/\text{m}^3$ Conv03 g/cm^3 / $\mu\text{g}/\text{m}^3$	Source Vapor Conc. C_{source} $\mu\text{g}/\text{m}^3$ (Input)
Analyte											
1,2,4-Trimethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	3.70E+03	2.00E-03	7.41E+00	4.30E-01	1.30E-01	1.00E+12	8.80E+00
1,3,5-Trimethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	8.55E+03	2.00E-03	1.71E+01	4.30E-01	1.30E-01	1.00E+12	2.90E+00
4-Ethyltoluene	1.00E-09	SCL	1.50E+00	3.00E-01	5.12E+03	2.00E-03	1.02E+01	4.30E-01	1.30E-01	1.00E+12	7.90E+00
Acetone	1.00E-09	SCL	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	3.80E+01
Chloromethane	1.00E-09	SCL	1.50E+00	3.00E-01	7.72E+01	2.00E-03	1.54E-01	4.30E-01	1.30E-01	1.00E+12	1.50E+00
Dichlorodifluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.63E+02	2.00E-03	7.26E-01	4.30E-01	1.30E-01	1.00E+12	1.20E+02
Ethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	1.30E+01
Isopropyl Alcohol	1.00E-09	SCL	1.50E+00	3.00E-01	6.97E-01	2.00E-03	1.39E-03	4.30E-01	1.30E-01	1.00E+12	1.70E+01
n-Hexane	1.00E-09	SCL	1.50E+00	3.00E-01	4.80E+02	2.00E-03	9.61E-01	4.30E-01	1.30E-01	1.00E+12	3.40E+00
Toluene	1.00E-09	SCL	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	1.40E+01
Trichlorofluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	1.58E+02	2.00E-03	3.17E-01	4.30E-01	1.30E-01	1.00E+12	2.90E+00
Xylene, m/p-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	4.80E+01
Xylene, o-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	1.20E+01

TABLE 7 (continued)
SOILGAS TO INDOOR AIR
GANGLANI

	Depth below grade to bottom of enclosed space L_F	Depth below grade to contamination L_t	Source Building Separation L_T	Diffusivity in air D_a	Diffusivity in water D_w	Vadose zone Effective Diffusion Coeff. D_v^{eff}	Total Overall Effective Diffusion Coeff. D_T^{eff}	Area of Enclosed Space Below Grade A_B	Building Ventilation Rate $Q_{building}$	Pressure Diff. between soil & enclosed space ΔP	Vadose zone soil saturated hydraulic conductivity $K_{s,v}$
Units:	cm	cm	cm	cm ² /s	cm ² /s	cm ² /s	cm ² /s	cm ²	cm ³ /s	g/cm-s ²	cm/hr
Formula:	(15 or 200 for screening)	(400 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(56335 for screening)	(40 for screening)	lookup
Analyte											
1,2,4-Trimethylbenzene	2.00E+02	4.00E+02	2.00E+02	6.02E-02	8.67E-06	3.68E-04	3.68E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
1,3,5-Trimethylbenzene	2.00E+02	4.00E+02	2.00E+02	6.02E-02	8.67E-06	3.68E-04	3.68E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
4-Ethyltoluene	2.00E+02	4.00E+02	2.00E+02	6.49E-02	7.84E-06	3.97E-04	3.97E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Acetone	2.00E+02	4.00E+02	2.00E+02	1.24E-01	1.14E-05	2.07E-03	2.07E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Chloromethane	2.00E+02	4.00E+02	2.00E+02	1.26E-01	6.50E-06	7.65E-04	7.65E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Dichlorodifluoromethane	2.00E+02	4.00E+02	2.00E+02	6.65E-02	9.92E-06	4.03E-04	4.03E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Ethylbenzene	2.00E+02	4.00E+02	2.00E+02	7.50E-02	7.80E-06	4.60E-04	4.60E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Isopropyl Alcohol	2.00E+02	4.00E+02	2.00E+02	9.80E-02	1.04E-05	3.68E-03	3.68E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
n-Hexane	2.00E+02	4.00E+02	2.00E+02	2.00E-01	7.77E-06	1.21E-03	1.21E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Toluene	2.00E+02	4.00E+02	2.00E+02	8.70E-02	8.60E-06	5.34E-04	5.34E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Trichlorofluoromethane	2.00E+02	4.00E+02	2.00E+02	8.70E-02	9.70E-06	5.27E-04	5.27E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Xylene, m/p-	2.00E+02	4.00E+02	2.00E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Xylene, o-	2.00E+02	4.00E+02	2.00E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01

TABLE 7 (continued)
SOILGAS TO INDOOR AIR
GANGLANI

	Conversion Factor hr to s Conv02 Units: Formula:	Viscosity of water at 10°C μ_{w-10} g/cm-s	Viscosity of water at system temp. μ_w g/cm-s (Note 16)	Density of water ρ_w g/cm ³ (0.999 for screening)	Acceleration due to gravity g cm/s ²	Vadose zone soil intrinsic permeability $k_{i,v}$ cm ² (Note 17)	Vadose zone residual soil water content $\theta_{r,v}$ cm ³ /cm ³ lookup	Vadose zone effective total fluid saturation S_{te} unitless (Note 18)	Vadose zone van Genuchten shape parameter M_v unitless lookup	Vadose zone soil relative air permeability k_{rg} unitless (Note 19)	Vadose zone soil effective vapor permeability k_v cm ² (Note 20)
Analyte											
1,2,4-Trimethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
1,3,5-Trimethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
4-Ethyltoluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Acetone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Dichlorodifluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Ethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Isopropyl Alcohol	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Hexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Toluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Trichlorofluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, m/p-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, o-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09

TABLE 7 (continued)
SOILGAS TO INDOOR AIR
GANGLANI

	Floor-wall seam perimeter X_{crack} Units: cm Formula: (3844 for screening)	Vapor viscosity at avg. soil temp. μ_{TS} g/cm-s $0.00018*(T_g/298.15)^{0.5}$	Crack depth below grade Z_{crack} cm (= L_F for screening)	Total area of cracks A_{crack} cm ² (384 for screening)	Crack-to-total area ratio η unitless A_{crack}/A_B	Equivalent crack radius r_{crack} cm $\eta(A_B/X_{crack})$	Avg. Vapor Flow Rate Into Bldg. Q_{soil} cm ³ /s (Note 5)	Foundation or Slab Thickness L_{crack} cm (15 for screening)	Crack Effective Diffusion Coeff. D^{crack} cm ² /s (Note 1)	Infinite Source Indoor Attenuation Coeff. α unitless (Note 6)	Infinite Source Bldg. Conc. $C_{building}$ µg/m ³ $C_{source} * \alpha$
Analyte											
1,2,4-Trimethylbenzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	3.68E-04	1.05E-05	9.27E-05
1,3,5-Trimethylbenzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	3.68E-04	1.05E-05	3.06E-05
4-Ethyltoluene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	3.97E-04	1.07E-05	8.44E-05
Acetone	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	2.07E-03	1.25E-05	4.75E-04
Chloromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	7.65E-04	1.17E-05	1.75E-05
Dichlorodifluoromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.03E-04	1.07E-05	1.29E-03
Ethylbenzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.60E-04	1.10E-05	1.42E-04
Isopropyl Alcohol	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	3.68E-03	1.27E-05	2.16E-04
n-Hexane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	1.21E-03	1.22E-05	4.13E-05
Toluene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.34E-04	1.12E-05	1.57E-04
Trichlorofluoromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.27E-04	1.12E-05	3.24E-05
Xylene, m/p-	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.73E-04	1.10E-05	5.28E-04
Xylene, o-	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.73E-04	1.10E-05	1.32E-04

TABLE 7 (continued)
SOILGAS TO INDOOR AIR
GANGLANI

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- (1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- (2) For screening, $A_B = 923,521 \text{ cm}^2$ for $L_F = 15 \text{ cm}$ and $A_B = 1,692,321 \text{ cm}^2$ for $L_F = 200 \text{ cm}$
- (3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.
- (4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$
- (5) $Q_{soil} = (2 * \pi * \Delta P * k_v * X_{crack}) / (\mu_{TS} * \ln(2 * Z_{crack} / r_{crack}))$
- (6) $\alpha = [(D_T^{eff} * A_B / (Q_{building} * L_T)) * \text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack}))] / [\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) + (D_T^{eff} * A_B / (Q_{building} * L_T)) + (D_T^{eff} * A_B / (Q_{soil} * L_T)) * (\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) - 1)]$
- (7) A function of the ratio T_B/T_C :

T_B/T_C	α
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C) - 0.116$
>0.71	0.41
- (8) $\Delta H_{v,TS} = \Delta H_{v,B} * [(1 - T_S/T_C) / (1 - T_B/T_C)]^n$
- (9) $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_c * (1/T_S - 1/T_R)] * H_R$; or taken from lookup table.
- (10) Refer to 12 SCS soil types - use SC for screening.
- (11) Refer to 12 SCS soil types - use SCL for screening.
- (12) $L_{cz} = 0.15 / (0.2 * D_{cz})$
- (13) $D_v^{eff} = D_a * (\theta_{av}^{3.33} / n_v^2) + (D_w / H'_{TS}) * (\theta_{w,v}^{3.33} / n_v^2)$
- (14) $D_{cz}^{eff} = D_a * (\theta_{acz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS}) * (\theta_{w,cz}^{3.33} / n_{cz}^2)$
- (15) $\theta_{w,cz} = \theta_{r,cz} + ((\theta_{s,cz} - \theta_{r,cz}) / (2^{M_{cz}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- (16) $\mu_w = \mu_{w-10} * (T'_S / 283.15)^{0.5}$
- (17) $k_{i,v} = K_{s,v} * 1 / \text{Conv}02 * \mu_w / (\rho_w * g)$
- (18) $S_{ie} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$
- (19) $k_{rg} = (1 - S_{ie})^{0.5} * (1 - S_{ie}^{1/M_v})^{2M_v}$
- (20) $k_v = k_{i,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- (21) $C_{source} = H'_{TS} * C_R * \text{Conv}01 * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * \text{Conv}02$

**TABLE 8
SOILGAS TO OUTDOOR AIR
GANGLANI**

	Soil EPC	Soil Temp.	Soil Temp.	Henry's Law Constant at ref. temp.	Henry's Law Reference Temp.	Normal Boiling Point	Enthalpy of vaporization at T _S	Critical Temp.	Enthalpy of vaporization constant	Enthalpy of vaporization at T _S	Gas Constant	Henry's Law Constant at T _S	Gas Constant	Henry's Law Constant
	C _R	T _S	T' _S	H _R	T _R	T _B	ΔH _{v,B}	T _C	n	ΔH _{v,T_S}	R _c	H _{T_S}	R	H' _{T_S}
Units:	μg/kg	°C	K	atm-m ³ /mol	K	K	cal/mol	K	unitless	cal/mol	cal/mol-K	atm-m ³ /mol	m ³ -atm/mol-K	unitless
Formula:	Input	(10 for screening)	(T _S +273.15)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)		(Note 9)		H _{T_S} / (R * T' _S)
Analyte														
1,2,4-Trimethylbenzene	Not used	1.00E+01	2.83E+02	6.16E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	6.16E-03	8.21E-05	2.65E-01
1,3,5-Trimethylbenzene	Not used	1.00E+01	2.83E+02	5.88E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	5.88E-03	8.21E-05	2.53E-01
4-Ethyltoluene	Not used	1.00E+01	2.83E+02	5.00E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	5.00E-03	8.21E-05	2.15E-01
Acetone	Not used	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	1.97E-05	8.21E-05	8.50E-04
Chloromethane	Not used	1.00E+01	2.83E+02	8.21E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	8.21E-03	8.21E-05	3.53E-01
Dichlorodifluoromethane	Not used	1.00E+01	2.83E+02	3.90E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	3.90E-01	8.21E-05	1.68E+01
Ethylbenzene	Not used	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	3.18E-03	8.21E-05	1.37E-01
Isopropyl Alcohol	Not used	1.00E+01	2.83E+02	7.69E-06	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.69E-06	8.21E-05	3.31E-04
n-Hexane	Not used	1.00E+01	2.83E+02	1.67E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.67E+00	8.21E-05	7.17E+01
Toluene	Not used	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	2.93E-03	8.21E-05	1.26E-01
Trichlorofluoromethane	Not used	1.00E+01	2.83E+02	1.00E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.00E-01	8.21E-05	4.30E+00
Xylene, m/p-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01
Xylene, o-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01

TABLE 8 (continued)
SOILGAS TO OUTDOOR AIR
GANGLANI

	Conversion Factor µg/kg to g/g	SCS soil type in vadose zone	Vadose zone soil dry bulk density	Vadose zone soil water-filled porosity	Organic carbon partition coefficient	Vadose zone organic carbon fraction	Soil-water partition coefficient	Vadose zone soil total porosity	Vadose zone soil air-filled porosity	Conversion Factor g/cm ³ to µg/m ³	Source Vapor Conc. C _{source}
	Conv01	ST _v	ρ _b	θ _{w,v}	K _{oc}	f _{oc,v}	K _d	n _v	θ _{a,v}	Conv03	C _{source}
	Units: µg/kg / g/g	unitless	g/cm ³	cm ³ /cm ³	cm ³ /g	unitless	cm ³ /g	cm ³ /cm ³	cm ³ /cm ³	g/cm ³ / µg/m ³	µg/m ³
	Formula:	(Note 11)	(1.5 for screening)	(0.3 for screening)	lookup	(0.002 for screening)	K _{oc} * f _{oc}	(0.43 for screening)	n _v - θ _{w,v}		(Input)
					not used	not used	not used				
Analyte											
1,2,4-Trimethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	3.70E+03	2.00E-03	7.41E+00	4.30E-01	1.30E-01	1.00E+12	8.80E+00
1,3,5-Trimethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	8.55E+03	2.00E-03	1.71E+01	4.30E-01	1.30E-01	1.00E+12	2.90E+00
4-Ethyltoluene	1.00E-09	SCL	1.50E+00	3.00E-01	5.12E+03	2.00E-03	1.02E+01	4.30E-01	1.30E-01	1.00E+12	7.90E+00
Acetone	1.00E-09	SCL	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	3.80E+01
Chloromethane	1.00E-09	SCL	1.50E+00	3.00E-01	7.72E+01	2.00E-03	1.54E-01	4.30E-01	1.30E-01	1.00E+12	1.50E+00
Dichlorodifluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.63E+02	2.00E-03	7.26E-01	4.30E-01	1.30E-01	1.00E+12	1.20E+02
Ethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	1.30E+01
Isopropyl Alcohol	1.00E-09	SCL	1.50E+00	3.00E-01	6.97E-01	2.00E-03	1.39E-03	4.30E-01	1.30E-01	1.00E+12	1.70E+01
n-Hexane	1.00E-09	SCL	1.50E+00	3.00E-01	4.80E+02	2.00E-03	9.61E-01	4.30E-01	1.30E-01	1.00E+12	3.40E+00
Toluene	1.00E-09	SCL	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	1.40E+01
Trichlorofluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	1.58E+02	2.00E-03	3.17E-01	4.30E-01	1.30E-01	1.00E+12	2.90E+00
Xylene, m/p-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	4.80E+01
Xylene, o-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	1.20E+01

TABLE 8 (continued)
SOILGAS TO OUTDOOR AIR
GANGLANI

	Depth below grade to bottom of trench L_F	Depth below grade to contamination L_t	Source Trench Separation L_T	Diffusivity in air D_a	Diffusivity in water D_w	Vadose zone Effective Diffusion Coeff. D_v^{eff}	Total Overall Effective Diffusion Coeff. D_T^{eff}	Area of Trench Below Grade A_B	Trench Ventilation Rate Q_{trench}	Pressure Diff. between soil & enclosed space ΔP	Vadose zone soil saturated hydraulic conductivity $K_{s,v}$
Units:	cm	cm	cm	cm ² /s	cm ² /s	cm ² /s	cm ² /s	cm ²	cm ³ /s	g/cm-s ²	cm/hr
Formula:	(120 (4') for screening)	(400 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(Note 22)	(40 for screening)	lookup
Analyte											
1,2,4-Trimethylbenzene	1.20E+02	4.00E+02	2.80E+02	6.02E-02	8.67E-06	3.68E-04	3.68E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
1,3,5-Trimethylbenzene	1.20E+02	4.00E+02	2.80E+02	6.02E-02	8.67E-06	3.68E-04	3.68E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
4-Ethyltoluene	1.20E+02	4.00E+02	2.80E+02	6.49E-02	7.84E-06	3.97E-04	3.97E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Acetone	1.20E+02	4.00E+02	2.80E+02	1.24E-01	1.14E-05	2.07E-03	2.07E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Chloromethane	1.20E+02	4.00E+02	2.80E+02	1.26E-01	6.50E-06	7.65E-04	7.65E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Dichlorodifluoromethane	1.20E+02	4.00E+02	2.80E+02	6.65E-02	9.92E-06	4.03E-04	4.03E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Ethylbenzene	1.20E+02	4.00E+02	2.80E+02	7.50E-02	7.80E-06	4.60E-04	4.60E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Isopropyl Alcohol	1.20E+02	4.00E+02	2.80E+02	9.80E-02	1.04E-05	3.68E-03	3.68E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
n-Hexane	1.20E+02	4.00E+02	2.80E+02	2.00E-01	7.77E-06	1.21E-03	1.21E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Toluene	1.20E+02	4.00E+02	2.80E+02	8.70E-02	8.60E-06	5.34E-04	5.34E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Trichlorofluoromethane	1.20E+02	4.00E+02	2.80E+02	8.70E-02	9.70E-06	5.27E-04	5.27E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Xylene, m/p-	1.20E+02	4.00E+02	2.80E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Xylene, o-	1.20E+02	4.00E+02	2.80E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01

TABLE 8 (continued)
SOILGAS TO OUTDOOR AIR
GANGLANI

	Conversion Factor hr to s Conv02 Units: Formula:	Viscosity of water at 10°C μ_{w-10} g/cm-s	Viscosity of water at system temp. μ_w g/cm-s (Note 16)	Density of water ρ_w g/cm ³ (0.999 for screening)	Acceleration due to gravity g cm/s ²	Vadose zone soil intrinsic permeability $k_{i,v}$ cm ² (Note 17)	Vadose zone residual soil water content $\theta_{r,v}$ cm ³ /cm ³ lookup	Vadose zone effective total fluid saturation S_{te} unitless (Note 18)	Vadose zone van Genuchten shape parameter M_v unitless lookup	Vadose zone soil relative air permeability k_{rg} unitless (Note 19)	Vadose zone soil effective vapor permeability k_v cm ² (Note 20)
Analyte											
1,2,4-Trimethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
1,3,5-Trimethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
4-Ethyltoluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Acetone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Dichlorodifluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Ethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Isopropyl Alcohol	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Hexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Toluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Trichlorofluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, m/p-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, o-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09

TABLE 8 (continued)
SOILGAS TO OUTDOOR AIR
GANGLANI

	Thickness of soil between soilgas & trench	Vapor viscosity at avg. soil temp.	Avg. Vapor Flow Rate Into trench	Infinite Source Attenuation Coeff.	Infinite Source Trench Conc.
	L_{soil}	μ_{TS}	Q_{soil}	α	C_{trench}
Units:	cm	g/cm-s	cm ³ /s	unitless	µg/m ³
Formula:	(1 for screening)	$0.00018*(T_s/298.15)^{0.5}$	(Note 5)	(Note 6)	$C_{source} * \alpha$
Analyte					
1,2,4-Trimethylbenzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.30E-08
1,3,5-Trimethylbenzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	4.30E-09
4-Ethyltoluene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.17E-08
Acetone	1.00E+00	1.75E-04	2.52E-04	1.48E-09	5.63E-08
Chloromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.22E-09
Dichlorodifluoromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.78E-07
Ethylbenzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.93E-08
Isopropyl Alcohol	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.52E-08
n-Hexane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	5.04E-09
Toluene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.08E-08
Trichlorofluoromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	4.30E-09
Xylene, m/p-	1.00E+00	1.75E-04	2.52E-04	1.48E-09	7.11E-08
Xylene, o-	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.78E-08

TABLE 8 (continued)
SOILGAS TO OUTDOOR AIR
GANGLANI

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- (1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- (2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.
- (3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.
- (4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$
- (5) $Q_{soil} = (2 * \pi * \Delta P * k_v * X_{crack}) / (\mu_{TS} * \ln(2 * Z_{crack} / r_{crack}))$
- (6) $\alpha = [(D_T^{eff} * A_B / (Q_{building} * L_T)) * \text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack}))] / [\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) + (D_T^{eff} * A_B / (Q_{building} * L_T)) + (D_T^{eff} * A_B / (Q_{soil} * L_T)) * (\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) - 1)]$
- (7) A function of the ratio T_B/T_C :

T_B/T_C	α
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C) - 0.116$
>0.71	0.41
- (8) $\Delta H_{v,TS} = \Delta H_{v,B} * [(1 - T_S/T_C) / (1 - T_B/T_C)]^n$
- (9) $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_c * (1/T_S - 1/T_R)] * H_R$
- (10) Refer to 12 SCS soil types - use SC for screening.
- (11) Refer to 12 SCS soil types - use SCL for screening.
- (12) $L_{cz} = 0.15 / (0.2 * D_{cz})$
- (13) $D_v^{eff} = D_a * (\theta_{a,v}^{3.33} / n_v^2) + (D_w / H'_{TS}) * (\theta_{w,v}^{3.33} / n_v^2)$
- (14) $D_{cz}^{eff} = D_a * (\theta_{a,cz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS}) * (\theta_{w,cz}^{3.33} / n_{cz}^2)$
- (15) $\theta_{w,cz} = \theta_{r,cz} + ((\theta_{s,cz} - \theta_{r,cz}) / (2^{M_{cz}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- (16) $\mu_w = \mu_{w-10} * (\Gamma_S / 283.15)^{0.5}$
- (17) $k_{i,v} = K_{s,v} * 1 / \text{Conv02} * \mu_w / (\rho_w * g)$
- (18) $S_{ie} = (\theta_{w,v} - \theta_{i,v}) / (n_v - \theta_{i,v})$
- (19) $k_{rg} = (1 - S_{ie})^{0.5} * (1 - S_{ie}^{1/M_v})^{2M_v}$
- (20) $k_v = k_{i,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- (21) $C_{source} = H'_{TS} * C_R * \text{Conv01} * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * \text{Conv02}$
- (22) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

**TABLE 9
SOILGAS TO INDOOR AIR
GRAPHIQUE**

	Soil EPC C_R Units: $\mu\text{g}/\text{kg}$ Formula: Input	Soil Temp. T_S $^{\circ}\text{C}$ (10 for screening)	Soil Temp. T'_S K ($T_S + 273.15$)	Henry's Law Constant at ref. temp. H_R $\text{atm}\cdot\text{m}^3/\text{mol}$ lookup	Henry's Law Reference Temp. T_R K (lookup+273.15)	Normal Boiling Point T_B K lookup	Enthalpy of vaporization at T_S $\Delta H_{v,B}$ cal/mol lookup	Critical Temp. T_C K lookup	constant n unitless (Note 7)	Enthalpy of vaporization at T_S $\Delta H_{v,TS}$ cal/mol (Note 8)	Gas Constant R_c cal/mol-K (Note 9)	Henry's Law Constant at T_S H_{TS} $\text{atm}\cdot\text{m}^3/\text{mol}$ (Note 9)	Gas Constant R $\text{m}^3\cdot\text{atm}/\text{mol}\cdot\text{K}$	Henry's Law Constant H'_{TS} unitless $H_{TS} / (R * T'_S)$
Analyte														
1,3-Butadiene	Not used	1.00E+01	2.83E+02	4.94E-02	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	4.94E-02	8.21E-05	2.13E+00
Acetone	Not used	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	1.97E-05	8.21E-05	8.50E-04
Benzene	Not used	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	2.68E-03	8.21E-05	1.16E-01
Chloromethane	Not used	1.00E+01	2.83E+02	8.21E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	8.21E-03	8.21E-05	3.53E-01
Dichlorodifluoromethane	Not used	1.00E+01	2.83E+02	3.90E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	3.90E-01	8.21E-05	1.68E+01
Toluene	Not used	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	2.93E-03	8.21E-05	1.26E-01
Xylene, m/p-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

(1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor

TABLE 9 (continued)
SOILGAS TO INDOOR AIR
GRAPHIQUE

	Conversion Factor $\mu\text{g}/\text{kg}$ to g/g Conv01 Units: $\mu\text{g}/\text{kg}$ / g/g Formula:	SCS soil type in vadose zone ST_v unitless (Note 11)	Vadose zone soil dry bulk density ρ_b g/cm^3 (1.5 for screening)	Vadose zone soil water-filled porosity $\theta_{w,v}$ cm^3/cm^3 (0.3 for screening)	Organic carbon partition coefficient K_{oc} cm^3/g lookup not used	Vadose zone organic carbon fraction $f_{oc,v}$ unitless (0.002 for screening) not used	Soil-water partition coefficient K_d cm^3/g not used	Vadose zone soil total porosity n_v cm^3/cm^3 (0.43 for screening)	Vadose zone soil air-filled porosity $\theta_{a,v}$ cm^3/cm^3 $n_v - \theta_{w,v}$	Conversion Factor g/cm^3 to $\mu\text{g}/\text{m}^3$ Conv03 g/cm^3 / $\mu\text{g}/\text{m}^3$	Source Vapor Conc. C_{source} $\mu\text{g}/\text{m}^3$ (Input)
Analyte											
1,3-Butadiene	1.00E-09	SCL	1.50E+00	3.00E-01	6.91E+01	2.00E-03	1.38E-01	4.30E-01	1.30E-01	1.00E+12	2.40E+00
Acetone	1.00E-09	SCL	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	2.00E+01
Benzene	1.00E-09	SCL	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	2.40E+00
Chloromethane	1.00E-09	SCL	1.50E+00	3.00E-01	7.72E+01	2.00E-03	1.54E-01	4.30E-01	1.30E-01	1.00E+12	1.20E+00
Dichlorodifluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.63E+02	2.00E-03	7.26E-01	4.30E-01	1.30E-01	1.00E+12	4.10E+00
Toluene	1.00E-09	SCL	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	4.10E+00
Xylene, m/p-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	3.10E+00

TABLE 9 (continued)
SOILGAS TO INDOOR AIR
GRAPHIQUE

	Depth below grade to bottom of enclosed space L_F	Depth below grade to contamination L_t	Source Building Separation L_T	Diffusivity in air D_a	Diffusivity in water D_w	Vadose zone Effective Diffusion Coeff. D_v^{eff}	Total Overall Effective Diffusion Coeff. D_T^{eff}	Area of Enclosed Space Below Grade A_B	Building Ventilation Rate $Q_{building}$	Pressure Diff. between soil & enclosed space ΔP	Vadose zone soil saturated hydraulic conductivity $K_{s,v}$
Units:	cm	cm	cm	cm ² /s	cm ² /s	cm ² /s	cm ² /s	cm ²	cm ³ /s	g/cm-s ²	cm/hr
Formula:	(15 or 200 for screening)	(400 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(56335 for screening)	(40 for screening)	lookup
Analyte											
1,3-Butadiene	2.00E+02	4.00E+02	2.00E+02	2.49E-01	1.08E-05	1.51E-03	1.51E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Acetone	2.00E+02	4.00E+02	2.00E+02	1.24E-01	1.14E-05	2.07E-03	2.07E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Benzene	2.00E+02	4.00E+02	2.00E+02	8.80E-02	9.80E-06	5.42E-04	5.42E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Chloromethane	2.00E+02	4.00E+02	2.00E+02	1.26E-01	6.50E-06	7.65E-04	7.65E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Dichlorodifluoromethane	2.00E+02	4.00E+02	2.00E+02	6.65E-02	9.92E-06	4.03E-04	4.03E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Toluene	2.00E+02	4.00E+02	2.00E+02	8.70E-02	8.60E-06	5.34E-04	5.34E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Xylene, m/p-	2.00E+02	4.00E+02	2.00E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01

TABLE 9 (continued)
SOILGAS TO INDOOR AIR
GRAPHIQUE

	Conversion Factor hr to s Conv02 Units: Formula:	Viscosity of water at 10°C μ_{w-10} g/cm-s	Viscosity of water at system temp. μ_w g/cm-s (Note 16)	Density of water ρ_w g/cm ³ (0.999 for screening)	Acceleration due to gravity g cm/s ²	Vadose zone soil intrinsic permeability $k_{i,v}$ cm ² (Note 17)	Vadose zone residual soil water content $\theta_{r,v}$ cm ³ /cm ³ lookup	Vadose zone effective total fluid saturation S_{te} unitless (Note 18)	Vadose zone van Genuchten shape parameter M_v unitless lookup	Vadose zone soil relative air permeability k_{rg} unitless (Note 19)	Vadose zone soil effective vapor permeability k_v cm ² (Note 20)
Analyte											
1,3-Butadiene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Acetone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Benzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Dichlorodifluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Toluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, m/p-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09

TABLE 9 (continued)
SOILGAS TO INDOOR AIR
GRAPHIQUE

	Floor-wall seam perimeter X_{crack}	Vapor viscosity at avg. soil temp. μ_{TS}	Crack depth below grade Z_{crack}	Total area of cracks A_{crack}	Crack-to-total area ratio η	Equivalent crack radius r_{crack}	Avg. Vapor Flow Rate Into Bldg. Q_{soil}	Foundation or Slab Thickness L_{crack}	Crack Effective Diffusion Coeff. D^{crack}	Infinite Source Indoor Attenuation Coeff. α	Infinite Source Bldg. Conc. $C_{building}$
Units:	cm	g/cm-s	cm	cm ²	unitless	cm	cm ³ /s	cm	cm ² /s	unitless	µg/m ³
Formula:	(3844 for screening)	$0.00018 * (T_s / 298.15)^{0.5}$	(= L_F for screening)	(384 for screening)	A_{crack} / A_B	$\eta (A_B / X_{crack})$	(Note 5)	(15 for screening)	(Note 1)	(Note 6)	$C_{source} * \alpha$
Analyte											
1,3-Butadiene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	1.51E-03	1.23E-05	2.96E-05
Acetone	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	2.07E-03	1.25E-05	2.50E-04
Benzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.42E-04	1.12E-05	2.69E-05
Chloromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	7.65E-04	1.17E-05	1.40E-05
Dichlorodifluoromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.03E-04	1.07E-05	4.39E-05
Toluene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.34E-04	1.12E-05	4.59E-05
Xylene, m/p-	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.73E-04	1.10E-05	3.41E-05

TABLE 9 (continued)
SOILGAS TO INDOOR AIR
GRAPHIQUE

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- (1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- (2) For screening, $A_B = 923,521 \text{ cm}^2$ for $L_F = 15 \text{ cm}$ and $A_B = 1,692,321 \text{ cm}^2$ for $L_F = 200 \text{ cm}$
- (3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.
- (4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$
- (5) $Q_{soil} = (2 * \pi * \Delta P * k_v * X_{crack}) / (\mu_{TS} * \ln(2 * Z_{crack} / r_{crack}))$
- (6) $\alpha = [(D_T^{eff} * A_B / (Q_{building} * L_T)) * \text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack}))] / [\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) + (D_T^{eff} * A_B / (Q_{building} * L_T)) + (D_T^{eff} * A_B / (Q_{soil} * L_T)) * (\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) - 1)]$
- (7) A function of the ratio T_B/T_C :

T_B/T_C	α
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C) - 0.116$
>0.71	0.41
- (8) $\Delta H_{v,TS} = \Delta H_{v,B} * [(1 - T_S/T_C) / (1 - T_B/T_C)]^n$
- (9) $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_c * (1/T_S - 1/T_R)] * H_R$; or taken from lookup table.
- (10) Refer to 12 SCS soil types - use SC for screening.
- (11) Refer to 12 SCS soil types - use SCL for screening.
- (12) $L_{cz} = 0.15 / (0.2 * D_{cz})$
- (13) $D_v^{eff} = D_a * (\theta_{av}^{3.33} / n_v^2) + (D_w / H'_{TS}) * (\theta_{w,v}^{3.33} / n_v^2)$
- (14) $D_{cz}^{eff} = D_a * (\theta_{a,cz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS}) * (\theta_{w,cz}^{3.33} / n_{cz}^2)$
- (15) $\theta_{w,cz} = \theta_{rcz} + ((\theta_{scz} - \theta_{rcz}) / (2^{M_{cz}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- (16) $\mu_w = \mu_{w-10} * (T_S / 283.15)^{0.5}$
- (17) $k_{i,v} = K_{s,v} * 1/\text{Conv}02 * \mu_w / (\rho_w * g)$
- (18) $S_{ie} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$
- (19) $k_{rg} = (1 - S_{ie})^{0.5} * (1 - S_{ie}^{1/M_v})^{2M_v}$
- (20) $k_v = k_{i,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- (21) $C_{source} = H'_{TS} * C_R * \text{Conv}01 * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * \text{Conv}02$

**TABLE 10
SOILGAS TO OUTDOOR AIR
GRAPHIQUE**

	Soil EPC	Soil Temp.	Soil Temp.	Henry's Law Constant at ref. temp.	Henry's Law Reference Temp.	Normal Boiling Point	Enthalpy of vaporization at T _S	Critical Temp.	Enthalpy of vaporization constant	Enthalpy of vaporization at T _S	Gas Constant	Henry's Law Constant at T _S	Gas Constant	Henry's Law Constant
	C _R	T _S	T' _S	H _R	T _R	T _B	ΔH _{v,B}	T _C	n	ΔH _{v,T_S}	R _c	H _{T_S}	R	H' _{T_S}
Units:	μg/kg	°C	K	atm·m ³ /mol	K	K	cal/mol	K	unitless	cal/mol	cal/mol-K	atm·m ³ /mol	m ³ ·atm/mol-K	unitless
Formula:	Input	(10 for screening)	(T _S +273.15)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)		(Note 9)		H _{T_S} / (R * T' _S)
Analyte														
1,3-Butadiene	Not used	1.00E+01	2.83E+02	4.94E-02	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	4.94E-02	8.21E-05	2.13E+00
Acetone	Not used	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	1.97E-05	8.21E-05	8.50E-04
Benzene	Not used	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	2.68E-03	8.21E-05	1.16E-01
Chloromethane	Not used	1.00E+01	2.83E+02	8.21E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	8.21E-03	8.21E-05	3.53E-01
Dichlorodifluoromethane	Not used	1.00E+01	2.83E+02	3.90E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	3.90E-01	8.21E-05	1.68E+01
Toluene	Not used	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	2.93E-03	8.21E-05	1.26E-01
Xylene, m/p-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01

TABLE 10 (continued)
SOILGAS TO OUTDOOR AIR
GRAPHIQUE

	Conversion Factor µg/kg to g/g	SCS soil type in vadose zone ST _v	Vadose zone soil dry bulk density ρ _b	Vadose zone soil water-filled porosity θ _{w,v}	Organic carbon partition coefficient K _{oc}	Vadose zone organic carbon fraction f _{oc,v}	Soil-water partition coefficient K _d	Vadose zone soil total porosity n _v	Vadose zone soil air-filled porosity θ _{a,v}	Conversion Factor g/cm ³ to µg/m ³	Source Vapor Conc. C _{source}
	Units: µg/kg / g/g	unitless	g/cm ³	cm ³ /cm ³	cm ³ /g	unitless	cm ³ /g	cm ³ /cm ³	cm ³ /cm ³	g/cm ³ / µg/m ³	µg/m ³
	Formula:	(Note 11)	(1.5 for screening)	(0.3 for screening)	lookup	(0.002 for screening)	K _{oc} * f _{oc}	(0.43 for screening)	n _v - θ _{w,v}	Conv03	(Input)
					not used	not used	not used				
Analyte											
1,3-Butadiene	1.00E-09	SCL	1.50E+00	3.00E-01	6.91E+01	2.00E-03	1.38E-01	4.30E-01	1.30E-01	1.00E+12	2.40E+00
Acetone	1.00E-09	SCL	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	2.00E+01
Benzene	1.00E-09	SCL	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	2.40E+00
Chloromethane	1.00E-09	SCL	1.50E+00	3.00E-01	7.72E+01	2.00E-03	1.54E-01	4.30E-01	1.30E-01	1.00E+12	1.20E+00
Dichlorodifluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.63E+02	2.00E-03	7.26E-01	4.30E-01	1.30E-01	1.00E+12	4.10E+00
Toluene	1.00E-09	SCL	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	4.10E+00
Xylene, m/p-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	3.10E+00

TABLE 10 (continued)
SOILGAS TO OUTDOOR AIR
GRAPHIQUE

	Depth below grade to bottom of trench L_F	Depth below grade to contamination L_t	Source Trench Separation L_T	Diffusivity in air D_a	Diffusivity in water D_w	Vadose zone Effective Diffusion Coeff. D_v^{eff}	Total Overall Effective Diffusion Coeff. D_T^{eff}	Area of Trench Below Grade A_B	Trench Ventilation Rate Q_{trench}	Pressure Diff. between soil & enclosed space ΔP	Vadose zone soil saturated hydraulic conductivity $K_{s,v}$
Units:	cm	cm	cm	cm ² /s	cm ² /s	cm ² /s	cm ² /s	cm ²	cm ³ /s	g/cm-s ²	cm/hr
Formula:	(120 (4') for screening)	(400 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(Note 22)	(40 for screening)	lookup
Analyte											
1,3-Butadiene	1.20E+02	4.00E+02	2.80E+02	2.49E-01	1.08E-05	1.51E-03	1.51E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Acetone	1.20E+02	4.00E+02	2.80E+02	1.24E-01	1.14E-05	2.07E-03	2.07E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Benzene	1.20E+02	4.00E+02	2.80E+02	8.80E-02	9.80E-06	5.42E-04	5.42E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Chloromethane	1.20E+02	4.00E+02	2.80E+02	1.26E-01	6.50E-06	7.65E-04	7.65E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Dichlorodifluoromethane	1.20E+02	4.00E+02	2.80E+02	6.65E-02	9.92E-06	4.03E-04	4.03E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Toluene	1.20E+02	4.00E+02	2.80E+02	8.70E-02	8.60E-06	5.34E-04	5.34E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Xylene, m/p-	1.20E+02	4.00E+02	2.80E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01

TABLE 10 (continued)
SOILGAS TO OUTDOOR AIR
GRAPHIQUE

	Conversion Factor hr to s Conv02 Units: Formula:	Viscosity of water at 10°C μ_{w-10} g/cm-s	Viscosity of water at system temp. μ_w g/cm-s (Note 16)	Density of water ρ_w g/cm ³ (0.999 for screening)	Acceleration due to gravity g cm/s ²	Vadose zone soil intrinsic permeability $k_{i,v}$ cm ² (Note 17)	Vadose zone residual soil water content $\theta_{r,v}$ cm ³ /cm ³ lookup	Vadose zone effective total fluid saturation S_{te} unitless (Note 18)	Vadose zone van Genuchten shape parameter M_v unitless lookup	Vadose zone soil relative air permeability k_{rg} unitless (Note 19)	Vadose zone soil effective vapor permeability k_v cm ² (Note 20)
Analyte											
1,3-Butadiene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Acetone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Benzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Dichlorodifluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Toluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, m/p-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09

TABLE 10 (continued)
SOILGAS TO OUTDOOR AIR
GRAPHIQUE

	Thickness of soil between soilgas & trench	Vapor viscosity at avg. soil temp.	Avg. Vapor Flow Rate Into trench	Infinite Source Attenuation Coeff.	Infinite Source Trench Conc.
	L_{soil}	μ_{TS}	Q_{soil}	α	C_{trench}
Units:	cm	g/cm-s	cm ³ /s	unitless	µg/m ³
Formula:	(1 for screening)	$0.00018*(T_s/298.15)^{0.5}$	(Note 5)	(Note 6)	$C_{source} * \alpha$
Analyte					
1,3-Butadiene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	3.56E-09
Acetone	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.97E-08
Benzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	3.56E-09
Chloromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.78E-09
Dichlorodifluoromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	6.08E-09
Toluene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	6.08E-09
Xylene, m/p-	1.00E+00	1.75E-04	2.52E-04	1.48E-09	4.59E-09

TABLE 10 (continued)
SOILGAS TO OUTDOOR AIR
GRAPHIQUE

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- (1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- (2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.
- (3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.
- (4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$
- (5) $Q_{soil} = (2 * \pi * \Delta P * k_v * X_{crack}) / (\mu_{TS} * \ln(2 * Z_{crack} / r_{crack}))$
- (6) $\alpha = [(D_T^{eff} * A_B / (Q_{building} * L_T)) * \text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack}))] / [\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) + (D_T^{eff} * A_B / (Q_{building} * L_T)) + (D_T^{eff} * A_B / (Q_{soil} * L_T)) * (\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) - 1)]$
- (7) A function of the ratio T_B/T_C :

T_B/T_C	α
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C) - 0.116$
>0.71	0.41
- (8) $\Delta H_{v,TS} = \Delta H_{v,B} * [(1 - T_S/T_C) / (1 - T_B/T_C)]^n$
- (9) $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_c * (1/T_S - 1/T_R)] * H_R$
- (10) Refer to 12 SCS soil types - use SC for screening.
- (11) Refer to 12 SCS soil types - use SCL for screening.
- (12) $L_{cz} = 0.15 / (0.2 * D_{cz})$
- (13) $D_v^{eff} = D_a * (\theta_{a,v}^{3.33} / n_v^2) + (D_w / H'_{TS}) * (\theta_{w,v}^{3.33} / n_v^2)$
- (14) $D_{cz}^{eff} = D_a * (\theta_{a,cz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS}) * (\theta_{w,cz}^{3.33} / n_{cz}^2)$
- (15) $\theta_{w,cz} = \theta_{r,cz} + ((\theta_{s,cz} - \theta_{r,cz}) / (2^{M_{cz}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- (16) $\mu_w = \mu_{w-10} * (T'_S / 283.15)^{0.5}$
- (17) $k_{i,v} = K_{s,v} * 1 / \text{Conv02} * \mu_w / (\rho_w * g)$
- (18) $S_{ie} = (\theta_{w,v} - \theta_{i,v}) / (n_v - \theta_{i,v})$
- (19) $k_{rg} = (1 - S_{ie})^{0.5} * (1 - S_{ie}^{1/M_v})^{2M_v}$
- (20) $k_v = k_{i,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- (21) $C_{source} = H'_{TS} * C_R * \text{Conv01} * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * \text{Conv02}$
- (22) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

**TABLE 11
SOILGAS TO INDOOR AIR
PACER**

	Soil EPC C_R Units: $\mu\text{g}/\text{kg}$ Formula: Input	Soil Temp. T_S $^{\circ}\text{C}$ (10 for screening)	Soil Temp. T'_S K ($T_S + 273.15$)	Henry's Law Constant at ref. temp. H_R $\text{atm}\cdot\text{m}^3/\text{mol}$ lookup	Henry's Law Reference Temp. T_R K (lookup+273.15)	Normal Boiling Point T_B K lookup	Enthalpy of vaporization at T_S $\Delta H_{v,B}$ cal/mol lookup	Critical Temp. T_C K lookup	constant n unitless (Note 7)	Enthalpy of vaporization at T_S $\Delta H_{v,T_S}$ cal/mol (Note 8)	Gas Constant R_c cal/mol-K	Henry's Law Constant at T_S H_{T_S} $\text{atm}\cdot\text{m}^3/\text{mol}$ (Note 9)	Gas Constant R $\text{m}^3\cdot\text{atm}/\text{mol}\cdot\text{K}$	Henry's Law Constant H'_{T_S} unitless $H_{T_S} / (R * T_S)$
Analyte														
1,3-Butadiene	Not used	1.00E+01	2.83E+02	4.94E-02	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	4.94E-02	8.21E-05	2.13E+00
2-Butanone	Not used	1.00E+01	2.83E+02	2.74E-05	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	2.74E-05	8.21E-05	1.18E-03
Acetone	Not used	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	1.97E-05	8.21E-05	8.50E-04
Benzene	Not used	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	2.68E-03	8.21E-05	1.16E-01
Carbon Disulfide	Not used	1.00E+01	2.83E+02	3.02E-02	2.98E+02	3.19E+02	6.39E+03	5.52E+02	3.12E-01	6.68E+03	1.99E+00	1.66E-02	8.21E-05	7.15E-01
Chloromethane	Not used	1.00E+01	2.83E+02	8.21E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	8.21E-03	8.21E-05	3.53E-01
Cyclohexane	Not used	1.00E+01	2.83E+02	4.55E-02	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	4.55E-02	8.21E-05	1.96E+00
Dichlorodifluoromethane	Not used	1.00E+01	2.83E+02	3.90E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	3.90E-01	8.21E-05	1.68E+01
Ethylbenzene	Not used	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	3.18E-03	8.21E-05	1.37E-01
Methyl tert-Butyl Ether	Not used	1.00E+01	2.83E+02	1.35E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.35E-03	8.21E-05	5.81E-02
n-Heptane	Not used	1.00E+01	2.83E+02	2.70E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	2.70E+00	8.21E-05	1.16E+02
n-Hexane	Not used	1.00E+01	2.83E+02	1.67E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.67E+00	8.21E-05	7.17E+01
Toluene	Not used	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	2.93E-03	8.21E-05	1.26E-01
Xylene, m/p-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01
Xylene, o-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01

TABLE 11 (continued)
SOILGAS TO INDOOR AIR
PACER

	Conversion Factor $\mu\text{g}/\text{kg}$ to g/g Conv01 Units: $\mu\text{g}/\text{kg}$ / g/g Formula:	SCS soil type in vadose zone ST _v unitless (Note 11)	Vadose zone soil dry bulk density ρ_b g/cm^3 (1.5 for screening)	Vadose zone soil water-filled porosity $\theta_{w,v}$ cm^3/cm^3 (0.3 for screening)	Organic carbon partition coefficient K _{oc} cm^3/g lookup not used	Vadose zone organic carbon fraction $f_{oc,v}$ unitless (0.002 for screening) not used	Soil-water partition coefficient K _d cm^3/g K _{oc} * f _{oc} not used	Vadose zone soil total porosity n _v cm^3/cm^3 (0.43 for screening)	Vadose zone soil air-filled porosity $\theta_{a,v}$ cm^3/cm^3 n _v - $\theta_{w,v}$	Conversion Factor g/cm^3 to $\mu\text{g}/\text{m}^3$ Conv03 g/cm^3 / $\mu\text{g}/\text{m}^3$	Source Vapor Conc. C _{source} $\mu\text{g}/\text{m}^3$ (Input)
Analyte											
1,3-Butadiene	1.00E-09	SCL	1.50E+00	3.00E-01	6.91E+01	2.00E-03	1.38E-01	4.30E-01	1.30E-01	1.00E+12	2.00E+01
2-Butanone	1.00E-09	SCL	1.50E+00	3.00E-01	3.50E+00	2.00E-03	7.00E-03	4.30E-01	1.30E-01	1.00E+12	1.20E+02
Acetone	1.00E-09	SCL	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	2.10E+02
Benzene	1.00E-09	SCL	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	1.80E+01
Carbon Disulfide	1.00E-09	SCL	1.50E+00	3.00E-01	4.57E+01	2.00E-03	9.14E-02	4.30E-01	1.30E-01	1.00E+12	3.10E+00
Chloromethane	1.00E-09	SCL	1.50E+00	3.00E-01	7.72E+01	2.00E-03	1.54E-01	4.30E-01	1.30E-01	1.00E+12	1.20E+00
Cyclohexane	1.00E-09	SCL	1.50E+00	3.00E-01	3.07E+02	2.00E-03	6.14E-01	4.30E-01	1.30E-01	1.00E+12	2.40E+00
Dichlorodifluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.63E+02	2.00E-03	7.26E-01	4.30E-01	1.30E-01	1.00E+12	3.80E+00
Ethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	4.20E+00
Methyl tert-Butyl Ether	1.00E-09	SCL	1.50E+00	3.00E-01	7.40E+01	2.00E-03	1.48E-01	4.30E-01	1.30E-01	1.00E+12	4.70E+00
n-Heptane	1.00E-09	SCL	1.50E+00	3.00E-01	1.28E+03	2.00E-03	2.57E+00	4.30E-01	1.30E-01	1.00E+12	1.10E+01
n-Hexane	1.00E-09	SCL	1.50E+00	3.00E-01	4.80E+02	2.00E-03	9.61E-01	4.30E-01	1.30E-01	1.00E+12	1.30E+01
Toluene	1.00E-09	SCL	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	2.60E+01
Xylene, m/p-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	1.10E+01
Xylene, o-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	3.60E+00

TABLE 11 (continued)
SOILGAS TO INDOOR AIR
PACER

	Depth below grade to bottom of enclosed space	Depth below grade to contamination	Source Building Separation	Diffusivity in air	Diffusivity in water	Vadose zone Effective Diffusion Coeff.	Total Overall Effective Diffusion Coeff.	Area of Enclosed Space Below Grade	Building Ventilation Rate	Pressure Diff. between soil & enclosed space	Vadose zone soil saturated hydraulic conductivity
	L_F	L_t	L_T	D_a	D_w	D_v^{eff}	D_T^{eff}	A_B	$Q_{building}$	ΔP	$K_{s,v}$
Units:	cm	cm	cm	cm ² /s	cm ² /s	cm ² /s	cm ² /s	cm ²	cm ³ /s	g/cm-s ²	cm/hr
Formula:	(15 or 200 for screening)	(400 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(56335 for screening)	(40 for screening)	lookup
Analyte											
1,3-Butadiene	2.00E+02	4.00E+02	2.00E+02	2.49E-01	1.08E-05	1.51E-03	1.51E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
2-Butanone	2.00E+02	4.00E+02	2.00E+02	8.08E-02	9.80E-06	1.31E-03	1.31E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Acetone	2.00E+02	4.00E+02	2.00E+02	1.24E-01	1.14E-05	2.07E-03	2.07E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Benzene	2.00E+02	4.00E+02	2.00E+02	8.80E-02	9.80E-06	5.42E-04	5.42E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Carbon Disulfide	2.00E+02	4.00E+02	2.00E+02	1.04E-01	1.00E-05	6.32E-04	6.32E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Chloromethane	2.00E+02	4.00E+02	2.00E+02	1.26E-01	6.50E-06	7.65E-04	7.65E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Cyclohexane	2.00E+02	4.00E+02	2.00E+02	8.39E-02	9.10E-06	5.09E-04	5.09E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Dichlorodifluoromethane	2.00E+02	4.00E+02	2.00E+02	6.65E-02	9.92E-06	4.03E-04	4.03E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Ethylbenzene	2.00E+02	4.00E+02	2.00E+02	7.50E-02	7.80E-06	4.60E-04	4.60E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Methyl tert-Butyl Ether	2.00E+02	4.00E+02	2.00E+02	1.02E-01	1.05E-05	6.38E-04	6.38E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
n-Heptane	2.00E+02	4.00E+02	2.00E+02	9.26E-02	7.59E-06	5.61E-04	5.61E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
n-Hexane	2.00E+02	4.00E+02	2.00E+02	2.00E-01	7.77E-06	1.21E-03	1.21E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Toluene	2.00E+02	4.00E+02	2.00E+02	8.70E-02	8.60E-06	5.34E-04	5.34E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Xylene, m/p-	2.00E+02	4.00E+02	2.00E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Xylene, o-	2.00E+02	4.00E+02	2.00E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01

TABLE 11 (continued)
SOILGAS TO INDOOR AIR
PACER

	Conversion Factor hr to s Conv02 Units: Formula:	Viscosity of water at 10°C μ _{w-10} g/cm-s	Viscosity of water at system temp. μ _w g/cm-s (Note 16)	Density of water ρ _w g/cm ³ (0.999 for screening)	Acceleration due to gravity g cm/s ²	Vadose zone soil intrinsic permeability k _{i,v} cm ² (Note 17)	Vadose zone residual soil water content θ _{r,v} cm ³ /cm ³ lookup	Vadose zone effective total fluid saturation S _{te} unitless (Note 18)	Vadose zone van Genuchten shape parameter M _v unitless lookup	Vadose zone soil relative air permeability k _{rg} unitless (Note 19)	Vadose zone soil effective vapor permeability k _v cm ² (Note 20)
Analyte											
1,3-Butadiene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
2-Butanone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Acetone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Benzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Carbon Disulfide	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Cyclohexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Dichlorodifluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Ethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Methyl tert-Butyl Ether	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Heptane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Hexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Toluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, m/p-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, o-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09

TABLE 11 (continued)
SOILGAS TO INDOOR AIR
PACER

	Floor-wall seam perimeter X_{crack}	Vapor viscosity at avg. soil temp. μ_{TS}	Crack depth below grade Z_{crack}	Total area of cracks A_{crack}	Crack-to-total area ratio η	Equivalent crack radius r_{crack}	Avg. Vapor Flow Rate Into Bldg. Q_{soil}	Foundation or Slab Thickness L_{crack}	Crack Effective Diffusion Coeff. D^{crack}	Infinite Source Indoor Attenuation Coeff. α	Infinite Source Bldg. Conc. $C_{building}$
Units:	cm	g/cm-s	cm	cm ²	unitless	cm	cm ³ /s	cm	cm ² /s	unitless	µg/m ³
Formula:	(3844 for screening)	$0.00018*(T_s/298.15)^{0.5}$	(= L_F for screening)	(384 for screening)	A_{crack}/A_B	$\eta(A_B/X_{crack})$	(Note 5)	(15 for screening)	(Note 1)	(Note 6)	$C_{source} * \alpha$
Analyte											
1,3-Butadiene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	1.51E-03	1.23E-05	2.46E-04
2-Butanone	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	1.31E-03	1.22E-05	1.47E-03
Acetone	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	2.07E-03	1.25E-05	2.62E-03
Benzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.42E-04	1.12E-05	2.02E-04
Carbon Disulfide	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	6.32E-04	1.15E-05	3.55E-05
Chloromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	7.65E-04	1.17E-05	1.40E-05
Cyclohexane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.09E-04	1.11E-05	2.67E-05
Dichlorodifluoromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.03E-04	1.07E-05	4.07E-05
Ethylbenzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.60E-04	1.10E-05	4.60E-05
Methyl tert-Butyl Ether	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	6.38E-04	1.15E-05	5.39E-05
n-Heptane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.61E-04	1.13E-05	1.24E-04
n-Hexane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	1.21E-03	1.22E-05	1.58E-04
Toluene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.34E-04	1.12E-05	2.91E-04
Xylene, m/p-	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.73E-04	1.10E-05	1.21E-04
Xylene, o-	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.73E-04	1.10E-05	3.96E-05

TABLE 11 (continued)
SOILGAS TO INDOOR AIR
PACER

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- (1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- (2) For screening, $A_B = 923,521 \text{ cm}^2$ for $L_F = 15 \text{ cm}$ and $A_B = 1,692,321 \text{ cm}^2$ for $L_F = 200 \text{ cm}$
- (3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.
- (4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$
- (5) $Q_{soil} = (2 * \pi * \Delta P * k_v * X_{crack}) / (\mu_{TS} * \ln(2 * Z_{crack} / r_{crack}))$
- (6) $\alpha = [(D_T^{eff} * A_B / (Q_{building} * L_T)) * \text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack}))] / [\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) + (D_T^{eff} * A_B / (Q_{building} * L_T)) + (D_T^{eff} * A_B / (Q_{soil} * L_T)) * (\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) - 1)]$
- (7) A function of the ratio T_B/T_C :

T_B/T_C	α
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C) - 0.116$
>0.71	0.41
- (8) $\Delta H_{v,TS} = \Delta H_{v,B} * [(1 - T_S/T_C) / (1 - T_B/T_C)]^n$
- (9) $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_c * (1/T_S - 1/T_R)] * H_R$; or taken from lookup table.
- (10) Refer to 12 SCS soil types - use SC for screening.
- (11) Refer to 12 SCS soil types - use SCL for screening.
- (12) $L_{cz} = 0.15 / (0.2 * D_{cz})$
- (13) $D_v^{eff} = D_a * (\theta_{a,v}^{3.33} / n_v^2) + (D_w / H'_{TS}) * (\theta_{w,v}^{3.33} / n_v^2)$
- (14) $D_{cz}^{eff} = D_a * (\theta_{a,cz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS}) * (\theta_{w,cz}^{3.33} / n_{cz}^2)$
- (15) $\theta_{w,cz} = \theta_{r,cz} + ((\theta_{s,cz} - \theta_{r,cz}) / (2^{M_{cz}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- (16) $\mu_w = \mu_{w-10} * (T'_S / 283.15)^{0.5}$
- (17) $k_{i,v} = K_{s,v} * 1/\text{Conv02} * \mu_w / (\rho_w * g)$
- (18) $S_{ie} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$
- (19) $k_{rg} = (1 - S_{ie})^{1.5} * (1 - S_{ie}^{1/MV})^{4MV}$
- (20) $k_v = k_{i,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- (21) $C_{source} = H'_{TS} * C_R * \text{Conv01} * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * \text{Conv02}$

**TABLE 12
SOILGAS TO OUTDOOR AIR
PACER**

	Soil EPC	Soil Temp.	Soil Temp.	Henry's Law Constant at ref. temp.	Henry's Law Reference Temp.	Normal Boiling Point	Enthalpy of vaporization at T _S	Critical Temp.	Enthalpy of vaporization constant	Enthalpy of vaporization at T _S	Gas Constant	Henry's Law Constant at T _S	Gas Constant	Henry's Law Constant
	C _R	T _S	T' _S	H _R	T _R	T _B	ΔH _{v,B}	T _C	n	ΔH _{v,T_S}	R _c	H _{T_S}	R	H' _{T_S}
Units:	μg/kg	°C	K	atm·m ³ /mol	K	K	cal/mol	K	unitless	cal/mol	cal/mol-K	atm·m ³ /mol	m ³ ·atm/mol-K	unitless
Formula:	Input	(10 for screening)	(T _S +273.15)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)		(Note 9)		H _{T_S} / (R * T' _S)
Analyte														
1,3-Butadiene	Not used	1.00E+01	2.83E+02	4.94E-02	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	4.94E-02	8.21E-05	2.13E+00
2-Butanone	Not used	1.00E+01	2.83E+02	2.74E-05	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	2.74E-05	8.21E-05	1.18E-03
Acetone	Not used	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	1.97E-05	8.21E-05	8.50E-04
Benzene	Not used	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	2.68E-03	8.21E-05	1.16E-01
Carbon Disulfide	Not used	1.00E+01	2.83E+02	3.02E-02	2.98E+02	3.19E+02	6.39E+03	5.52E+02	3.12E-01	6.68E+03	1.99E+00	1.66E-02	8.21E-05	7.15E-01
Chloromethane	Not used	1.00E+01	2.83E+02	8.21E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	8.21E-03	8.21E-05	3.53E-01
Cyclohexane	Not used	1.00E+01	2.83E+02	4.55E-02	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	4.55E-02	8.21E-05	1.96E+00
Dichlorodifluoromethane	Not used	1.00E+01	2.83E+02	3.90E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	3.90E-01	8.21E-05	1.68E+01
Ethylbenzene	Not used	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	3.18E-03	8.21E-05	1.37E-01
Methyl tert-Butyl Ether	Not used	1.00E+01	2.83E+02	1.35E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.35E-03	8.21E-05	5.81E-02
n-Heptane	Not used	1.00E+01	2.83E+02	2.70E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	2.70E+00	8.21E-05	1.16E+02
n-Hexane	Not used	1.00E+01	2.83E+02	1.67E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.67E+00	8.21E-05	7.17E+01
Toluene	Not used	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	2.93E-03	8.21E-05	1.26E-01
Xylene, m/p-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01
Xylene, o-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01

TABLE 12 (continued)
SOILGAS TO OUTDOOR AIR
PACER

	Conversion Factor $\mu\text{g}/\text{kg}$ to g/g	SCS soil type in vadose zone	Vadose zone soil dry bulk density	Vadose zone soil water-filled porosity	Organic carbon partition coefficient	Vadose zone organic carbon fraction	Soil-water partition coefficient	Vadose zone soil total porosity	Vadose zone soil air-filled porosity	Conversion Factor g/cm^3 to $\mu\text{g}/\text{m}^3$	Source Vapor Conc. C_{source}
	Conv01	ST_v	ρ_b	$\theta_{w,v}$	K_{oc}	$f_{oc,v}$	K_d	n_v	$\theta_{a,v}$	Conv03	C_{source}
	Units: $\mu\text{g}/\text{kg}$ / g/g	unitless	g/cm^3	cm^3/cm^3	cm^3/g	unitless	cm^3/g	cm^3/cm^3	cm^3/cm^3	g/cm^3 / $\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
	Formula:	(Note 11)	(1.5 for screening)	(0.3 for screening)	lookup	(0.002 for screening)	$K_{oc} * f_{oc}$	(0.43 for screening)	$n_v - \theta_{w,v}$		(Input)
					not used	not used	not used				
Analyte											
1,3-Butadiene	1.00E-09	SCL	1.50E+00	3.00E-01	6.91E+01	2.00E-03	1.38E-01	4.30E-01	1.30E-01	1.00E+12	2.00E+01
2-Butanone	1.00E-09	SCL	1.50E+00	3.00E-01	3.50E+00	2.00E-03	7.00E-03	4.30E-01	1.30E-01	1.00E+12	1.20E+02
Acetone	1.00E-09	SCL	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	2.10E+02
Benzene	1.00E-09	SCL	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	1.80E+01
Carbon Disulfide	1.00E-09	SCL	1.50E+00	3.00E-01	4.57E+01	2.00E-03	9.14E-02	4.30E-01	1.30E-01	1.00E+12	3.10E+00
Chloromethane	1.00E-09	SCL	1.50E+00	3.00E-01	7.72E+01	2.00E-03	1.54E-01	4.30E-01	1.30E-01	1.00E+12	1.20E+00
Cyclohexane	1.00E-09	SCL	1.50E+00	3.00E-01	3.07E+02	2.00E-03	6.14E-01	4.30E-01	1.30E-01	1.00E+12	2.40E+00
Dichlorodifluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.63E+02	2.00E-03	7.26E-01	4.30E-01	1.30E-01	1.00E+12	3.80E+00
Ethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	4.20E+00
Methyl tert-Butyl Ether	1.00E-09	SCL	1.50E+00	3.00E-01	7.40E+01	2.00E-03	1.48E-01	4.30E-01	1.30E-01	1.00E+12	4.70E+00
n-Heptane	1.00E-09	SCL	1.50E+00	3.00E-01	1.28E+03	2.00E-03	2.57E+00	4.30E-01	1.30E-01	1.00E+12	1.10E+01
n-Hexane	1.00E-09	SCL	1.50E+00	3.00E-01	4.80E+02	2.00E-03	9.61E-01	4.30E-01	1.30E-01	1.00E+12	1.30E+01
Toluene	1.00E-09	SCL	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	2.60E+01
Xylene, m/p-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	1.10E+01
Xylene, o-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	3.60E+00

TABLE 12 (continued)
SOILGAS TO OUTDOOR AIR
PACER

	Depth below grade to bottom of trench L_F	Depth below grade to contamination L_t	Source Trench Separation L_T	Diffusivity in air D_a	Diffusivity in water D_w	Vadose zone Effective Diffusion Coeff. D_v^{eff}	Total Overall Effective Diffusion Coeff. D_T^{eff}	Area of Trench Below Grade A_B	Trench Ventilation Rate Q_{trench}	Pressure Diff. between soil & enclosed space ΔP	Vadose zone soil saturated hydraulic conductivity $K_{s,v}$
Units:	cm	cm	cm	cm ² /s	cm ² /s	cm ² /s	cm ² /s	cm ²	cm ³ /s	g/cm-s ²	cm/hr
Formula:	(120 (4') for screening)	(400 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(Note 22)	(40 for screening)	lookup
Analyte											
1,3-Butadiene	1.20E+02	4.00E+02	2.80E+02	2.49E-01	1.08E-05	1.51E-03	1.51E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
2-Butanone	1.20E+02	4.00E+02	2.80E+02	8.08E-02	9.80E-06	1.31E-03	1.31E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Acetone	1.20E+02	4.00E+02	2.80E+02	1.24E-01	1.14E-05	2.07E-03	2.07E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Benzene	1.20E+02	4.00E+02	2.80E+02	8.80E-02	9.80E-06	5.42E-04	5.42E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Carbon Disulfide	1.20E+02	4.00E+02	2.80E+02	1.04E-01	1.00E-05	6.32E-04	6.32E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Chloromethane	1.20E+02	4.00E+02	2.80E+02	1.26E-01	6.50E-06	7.65E-04	7.65E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Cyclohexane	1.20E+02	4.00E+02	2.80E+02	8.39E-02	9.10E-06	5.09E-04	5.09E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Dichlorodifluoromethane	1.20E+02	4.00E+02	2.80E+02	6.65E-02	9.92E-06	4.03E-04	4.03E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Ethylbenzene	1.20E+02	4.00E+02	2.80E+02	7.50E-02	7.80E-06	4.60E-04	4.60E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Methyl tert-Butyl Ether	1.20E+02	4.00E+02	2.80E+02	1.02E-01	1.05E-05	6.38E-04	6.38E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
n-Heptane	1.20E+02	4.00E+02	2.80E+02	9.26E-02	7.59E-06	5.61E-04	5.61E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
n-Hexane	1.20E+02	4.00E+02	2.80E+02	2.00E-01	7.77E-06	1.21E-03	1.21E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Toluene	1.20E+02	4.00E+02	2.80E+02	8.70E-02	8.60E-06	5.34E-04	5.34E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Xylene, m/p-	1.20E+02	4.00E+02	2.80E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Xylene, o-	1.20E+02	4.00E+02	2.80E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01

TABLE 12 (continued)
SOILGAS TO OUTDOOR AIR
PACER

	Conversion Factor hr to s Conv02 Units: Formula:	Viscosity of water at 10°C μ_{w-10} g/cm-s	Viscosity of water at system temp. μ_w g/cm-s (Note 16)	Density of water ρ_w g/cm ³ (0.999 for screening)	Acceleration due to gravity g cm/s ²	Vadose zone soil intrinsic permeability $k_{i,v}$ cm ² (Note 17)	Vadose zone residual soil water content $\theta_{r,v}$ cm ³ /cm ³ lookup	Vadose zone effective total fluid saturation S_{te} unitless (Note 18)	Vadose zone van Genuchten shape parameter M_v unitless lookup	Vadose zone soil relative air permeability k_{rg} unitless (Note 19)	Vadose zone soil effective vapor permeability k_v cm ² (Note 20)
Analyte											
1,3-Butadiene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
2-Butanone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Acetone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Benzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Carbon Disulfide	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Cyclohexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Dichlorodifluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Ethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Methyl tert-Butyl Ether	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Heptane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Hexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Toluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, m/p-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, o-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09

TABLE 12 (continued)
SOILGAS TO OUTDOOR AIR
PACER

	Thickness of soil between soilgas & trench	Vapor viscosity at avg. soil temp.	Avg. Vapor Flow Rate Into trench	Infinite Source Attenuation Coeff.	Infinite Source Trench Conc.
	L_{soil}	μ_{TS}	Q_{soil}	α	C_{trench}
Units:	cm	g/cm-s	cm ³ /s	unitless	µg/m ³
Formula:	(1 for screening)	$0.00018*(T_s/298.15)^{0.5}$	(Note 5)	(Note 6)	$C_{source} * \alpha$
Analyte					
1,3-Butadiene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.97E-08
2-Butanone	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.78E-07
Acetone	1.00E+00	1.75E-04	2.52E-04	1.48E-09	3.11E-07
Benzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.67E-08
Carbon Disulfide	1.00E+00	1.75E-04	2.52E-04	1.48E-09	4.60E-09
Chloromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.78E-09
Cyclohexane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	3.56E-09
Dichlorodifluoromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	5.63E-09
Ethylbenzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	6.23E-09
Methyl tert-Butyl Ether	1.00E+00	1.75E-04	2.52E-04	1.48E-09	6.97E-09
n-Heptane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.63E-08
n-Hexane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.93E-08
Toluene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	3.85E-08
Xylene, m/p-	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.63E-08
Xylene, o-	1.00E+00	1.75E-04	2.52E-04	1.48E-09	5.34E-09

**TABLE 12 (continued)
SOILGAS TO OUTDOOR AIR
PACER**

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- (1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- (2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.
- (3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.
- (4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$
- (5) $Q_{soil} = (2 * \pi * \Delta P * k_v * X_{crack}) / (\mu_{TS} * \ln(2 * Z_{crack} / r_{crack}))$
- (6) $\alpha = [(D_T^{eff} * A_B / (Q_{building} * L_T)) * \text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack}))] / [\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) + (D_T^{eff} * A_B / (Q_{building} * L_T)) + (D_T^{eff} * A_B / (Q_{soil} * L_T)) * (\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) - 1)]$
- (7) A function of the ratio T_B/T_C :

T_B/T_C	α
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C) - 0.116$
>0.71	0.41
- (8) $\Delta H_{v,TS} = \Delta H_{v,B} * [(1 - T_S/T_C) / (1 - T_B/T_C)]^2$
- (9) $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_c * (1/T_S - 1/T_R)] * H_R$
- (10) Refer to 12 SCS soil types - use SC for screening.
- (11) Refer to 12 SCS soil types - use SCL for screening.
- (12) $L_{cz} = 0.15 / (0.2 * D_{cz})$
- (13) $D_v^{eff} = D_a * (\theta_{a,v}^{3.33} / n_v^2) + (D_w / H'_{TS}) * (\theta_{w,v}^{3.33} / n_v^2)$
- (14) $D_{cz}^{eff} = D_a * (\theta_{a,cz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS}) * (\theta_{w,cz}^{3.33} / n_{cz}^2)$
- (15) $\theta_{w,cz} = \theta_{r,cz} + ((\theta_{s,cz} - \theta_{r,cz}) / (2^{MCZ}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- (16) $\mu_w = \mu_{w-10} * (\Gamma'_S / 283.15)^{0.5}$
- (17) $k_{i,v} = K_{s,v} * 1 / \text{Conv02} * \mu_w / (\rho_w * g)$
- (18) $S_{ie} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$
- (19) $k_{rg} = (1 - S_{ie})^{1.5} * (1 - S_{ie}^{1/MV})^{2MV}$
- (20) $k_v = k_{i,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- (21) $C_{source} = H'_{TS} * C_R * \text{Conv01} * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * \text{Conv02}$
- (22) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

**TABLE 13
SOILGAS TO INDOOR AIR
SACCO**

	Soil EPC	Soil Temp.	Soil Temp.	Henry's Law Constant	Henry's Law Reference	Normal Boiling Point	Enthalpy of vaporization	Critical Temp.	Enthalpy of vaporization	Enthalpy of vaporization	Gas Constant	Henry's Law Constant	Gas Constant	Henry's Law Constant
	C_R	T_S	T'_S	at ref. temp.	Temp.	T_B	at T_S	Temp.	at T_S	constant	R_c	at T_S	R	H'_{TS}
Units:	$\mu\text{g}/\text{kg}$	$^{\circ}\text{C}$	K	$\text{atm}\cdot\text{m}^3/\text{mol}$	K	K	cal/mol	K	cal/mol	unitless	cal/mol-K	$\text{atm}\cdot\text{m}^3/\text{mol}$	$\text{m}^3\cdot\text{atm}/\text{mol}\cdot\text{K}$	unitless
Formula:	Input	(10 for screening)	$(T_S + 273.15)$	lookup	$(\text{lookup} + 273.15)$	lookup	lookup	lookup	lookup	(Note 7)	(Note 8)	(Note 9)		$H_{TS} / (R * T_S)$
Analyte														
1,2,4-Trimethylbenzene	Not used	1.00E+01	2.83E+02	6.16E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	6.16E-03	8.21E-05	2.65E-01
1,3-Butadiene	Not used	1.00E+01	2.83E+02	4.94E-02	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	4.94E-02	8.21E-05	2.13E+00
4-Ethyltoluene	Not used	1.00E+01	2.83E+02	5.00E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	5.00E-03	8.21E-05	2.15E-01
Acetone	Not used	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	1.97E-05	8.21E-05	8.50E-04
Benzene	Not used	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	2.68E-03	8.21E-05	1.16E-01
Carbon Disulfide	Not used	1.00E+01	2.83E+02	3.02E-02	2.98E+02	3.19E+02	6.39E+03	5.52E+02	3.12E-01	6.68E+03	1.99E+00	1.66E-02	8.21E-05	7.15E-01
Chloroform	Not used	1.00E+01	2.83E+02	3.66E-03	2.98E+02	3.34E+02	6.99E+03	5.36E+02	3.45E-01	7.55E+03	1.99E+00	1.86E-03	8.21E-05	8.02E-02
Chloromethane	Not used	1.00E+01	2.83E+02	8.21E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	8.21E-03	8.21E-05	3.53E-01
Dichlorodifluoromethane	Not used	1.00E+01	2.83E+02	3.90E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	3.90E-01	8.21E-05	1.68E+01
Ethylbenzene	Not used	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	3.18E-03	8.21E-05	1.37E-01
n-Hexane	Not used	1.00E+01	2.83E+02	1.67E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.67E+00	8.21E-05	7.17E+01
Toluene	Not used	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	2.93E-03	8.21E-05	1.26E-01
Xylene, m/p-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01
Xylene, o-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01

TABLE 13 (continued)
SOILGAS TO INDOOR AIR
SACCO

	Conversion Factor $\mu\text{g}/\text{kg}$ to g/g Conv01 Units: $\mu\text{g}/\text{kg}$ / g/g Formula:	SCS soil type in vadose zone ST_v unitless (Note 11)	Vadose zone soil dry bulk density ρ_b g/cm^3 (1.5 for screening)	Vadose zone soil water-filled porosity θ_{wv} cm^3/cm^3 (0.3 for screening)	Organic carbon partition coefficient K_{oc} cm^3/g lookup not used	Vadose zone organic carbon fraction $f_{oc,v}$ unitless (0.002 for screening) not used	Soil-water partition coefficient K_d cm^3/g not used	Vadose zone soil total porosity n_v cm^3/cm^3 (0.43 for screening)	Vadose zone soil air-filled porosity θ_{av} cm^3/cm^3 $n_v - \theta_{wv}$	Conversion Factor g/cm^3 to $\mu\text{g}/\text{m}^3$ Conv03 g/cm^3 / $\mu\text{g}/\text{m}^3$	Source Vapor Conc. C_{source} $\mu\text{g}/\text{m}^3$ (Input)
Analyte											
1,2,4-Trimethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	3.70E+03	2.00E-03	7.41E+00	4.30E-01	1.30E-01	1.00E+12	3.30E+00
1,3-Butadiene	1.00E-09	SCL	1.50E+00	3.00E-01	6.91E+01	2.00E-03	1.38E-01	4.30E-01	1.30E-01	1.00E+12	3.10E+00
4-Ethyltoluene	1.00E-09	SCL	1.50E+00	3.00E-01	5.12E+03	2.00E-03	1.02E+01	4.30E-01	1.30E-01	1.00E+12	2.50E+00
Acetone	1.00E-09	SCL	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	4.80E+01
Benzene	1.00E-09	SCL	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	2.40E+00
Carbon Disulfide	1.00E-09	SCL	1.50E+00	3.00E-01	4.57E+01	2.00E-03	9.14E-02	4.30E-01	1.30E-01	1.00E+12	3.40E+00
Chloroform	1.00E-09	SCL	1.50E+00	3.00E-01	3.98E+01	2.00E-03	7.96E-02	4.30E-01	1.30E-01	1.00E+12	2.50E+00
Chloromethane	1.00E-09	SCL	1.50E+00	3.00E-01	7.72E+01	2.00E-03	1.54E-01	4.30E-01	1.30E-01	1.00E+12	1.40E+00
Dichlorodifluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.63E+02	2.00E-03	7.26E-01	4.30E-01	1.30E-01	1.00E+12	4.00E+00
Ethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	2.60E+00
n-Hexane	1.00E-09	SCL	1.50E+00	3.00E-01	4.80E+02	2.00E-03	9.61E-01	4.30E-01	1.30E-01	1.00E+12	2.00E+00
Toluene	1.00E-09	SCL	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	7.90E+00
Xylene, m/p-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	7.80E+00
Xylene, o-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	2.70E+00

TABLE 13 (continued)
SOILGAS TO INDOOR AIR
SACCO

	Depth below grade to bottom of enclosed space L_F	Depth below grade to contamination L_t	Source Building Separation L_T	Diffusivity in air D_a	Diffusivity in water D_w	Vadose zone Effective Diffusion Coeff. D_v^{eff}	Total Overall Effective Diffusion Coeff. D_T^{eff}	Area of Enclosed Space Below Grade A_B	Building Ventilation Rate $Q_{building}$	Pressure Diff. between soil & enclosed space ΔP	Vadose zone soil saturated hydraulic conductivity $K_{s,v}$
Units:	cm	cm	cm	cm ² /s	cm ² /s	cm ² /s	cm ² /s	cm ²	cm ³ /s	g/cm-s ²	cm/hr
Formula:	(15 or 200 for screening)	(400 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(56335 for screening)	(40 for screening)	lookup
Analyte											
1,2,4-Trimethylbenzene	2.00E+02	4.00E+02	2.00E+02	6.02E-02	8.67E-06	3.68E-04	3.68E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
1,3-Butadiene	2.00E+02	4.00E+02	2.00E+02	2.49E-01	1.08E-05	1.51E-03	1.51E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
4-Ethyltoluene	2.00E+02	4.00E+02	2.00E+02	6.49E-02	7.84E-06	3.97E-04	3.97E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Acetone	2.00E+02	4.00E+02	2.00E+02	1.24E-01	1.14E-05	2.07E-03	2.07E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Benzene	2.00E+02	4.00E+02	2.00E+02	8.80E-02	9.80E-06	5.42E-04	5.42E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Carbon Disulfide	2.00E+02	4.00E+02	2.00E+02	1.04E-01	1.00E-05	6.32E-04	6.32E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Chloroform	2.00E+02	4.00E+02	2.00E+02	1.04E-01	1.00E-05	6.43E-04	6.43E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Chloromethane	2.00E+02	4.00E+02	2.00E+02	1.26E-01	6.50E-06	7.65E-04	7.65E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Dichlorodifluoromethane	2.00E+02	4.00E+02	2.00E+02	6.65E-02	9.92E-06	4.03E-04	4.03E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Ethylbenzene	2.00E+02	4.00E+02	2.00E+02	7.50E-02	7.80E-06	4.60E-04	4.60E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
n-Hexane	2.00E+02	4.00E+02	2.00E+02	2.00E-01	7.77E-06	1.21E-03	1.21E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Toluene	2.00E+02	4.00E+02	2.00E+02	8.70E-02	8.60E-06	5.34E-04	5.34E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Xylene, m/p-	2.00E+02	4.00E+02	2.00E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Xylene, o-	2.00E+02	4.00E+02	2.00E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01

TABLE 13 (continued)
SOILGAS TO INDOOR AIR
SACCO

	Conversion Factor hr to s Conv02 Units: Formula:	Viscosity of water at 10°C μ _{w-10} g/cm-s	Viscosity of water at system temp. μ _w g/cm-s (Note 16)	Density of water ρ _w g/cm ³ (0.999 for screening)	Acceleration due to gravity g cm/s ²	Vadose zone soil intrinsic permeability k _{i,v} cm ² (Note 17)	Vadose zone residual soil water content θ _{r,v} cm ³ /cm ³ lookup	Vadose zone effective total fluid saturation S _{te} unitless (Note 18)	Vadose zone van Genuchten shape parameter M _v unitless lookup	Vadose zone soil relative air permeability k _{rg} unitless (Note 19)	Vadose zone soil effective vapor permeability k _v cm ² (Note 20)
Analyte											
1,2,4-Trimethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
1,3-Butadiene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
4-Ethyltoluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Acetone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Benzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Carbon Disulfide	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloroform	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Dichlorodifluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Ethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Hexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Toluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, m/p-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, o-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09

TABLE 13 (continued)
SOILGAS TO INDOOR AIR
SACCO

	Floor-wall seam perimeter	Vapor viscosity at avg. soil temp.	Crack depth below grade	Total area of cracks	Crack-to-total area ratio	Equivalent crack radius	Avg. Vapor Flow Rate Into Bldg.	Foundation or Slab Thickness	Crack Effective Diffusion Coeff.	Infinite Source Indoor Attenuation Coeff.	Infinite Source
	X_{crack}	μ_{TS}	Z_{crack}	A_{crack}	η	r_{crack}	Q_{soil}	L_{crack}	D^{crack}	α	$C_{building}$
Units:	cm	g/cm-s	cm	cm ²	unitless	cm	cm ³ /s	cm	cm ² /s	unitless	μg/m ³
Formula:	(3844 for screening)	$0.00018 * (T_g / 298.15)^{0.5}$	(= L_F for screening)	(384 for screening)	A_{crack} / A_B	$\eta(A_B / X_{crack})$	(Note 5)	(15 for screening)	(Note 1)	(Note 6)	$C_{source} * \alpha$
Analyte											
1,2,4-Trimethylbenzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	3.68E-04	1.05E-05	3.48E-05
1,3-Butadiene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	1.51E-03	1.23E-05	3.82E-05
4-Ethyltoluene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	3.97E-04	1.07E-05	2.67E-05
Acetone	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	2.07E-03	1.25E-05	6.00E-04
Benzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.42E-04	1.12E-05	2.69E-05
Carbon Disulfide	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	6.32E-04	1.15E-05	3.89E-05
Chloroform	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	6.43E-04	1.15E-05	2.87E-05
Chloromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	7.65E-04	1.17E-05	1.64E-05
Dichlorodifluoromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.03E-04	1.07E-05	4.29E-05
Ethylbenzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.60E-04	1.10E-05	2.85E-05
n-Hexane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	1.21E-03	1.22E-05	2.43E-05
Toluene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.34E-04	1.12E-05	8.85E-05
Xylene, m/p-	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.73E-04	1.10E-05	8.58E-05
Xylene, o-	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.73E-04	1.10E-05	2.97E-05

TABLE 13 (continued)
SOILGAS TO INDOOR AIR
SACCO

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- (1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- (2) For screening, $A_B = 923,521 \text{ cm}^2$ for $L_F = 15 \text{ cm}$ and $A_B = 1,692,321 \text{ cm}^2$ for $L_F = 200 \text{ cm}$
- (3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.
- (4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$
- (5) $Q_{soil} = (2 * \pi * \Delta P * k_v * X_{crack}) / (\mu_{TS} * \ln(2 * Z_{crack} / r_{crack}))$
- (6) $\alpha = [(D_T^{eff} * A_B / (Q_{building} * L_T)) * \text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack}))] / [\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) + (D_T^{eff} * A_B / (Q_{building} * L_T)) + (D_T^{eff} * A_B / (Q_{soil} * L_T)) * (\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) - 1)]$
- (7) A function of the ratio T_B/T_C :

T_B/T_C	α
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C) - 0.116$
>0.71	0.41
- (8) $\Delta H_{v,TS} = \Delta H_{v,B} * [(1 - T_S/T_C) / (1 - T_B/T_C)]^n$
- (9) $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_c * (1/T_S - 1/T_R)] * H_R$; or taken from lookup table.
- (10) Refer to 12 SCS soil types - use SC for screening.
- (11) Refer to 12 SCS soil types - use SCL for screening.
- (12) $L_{cz} = 0.15 / (0.2 * D_{cz})$
- (13) $D_v^{eff} = D_a * (\theta_{a,v}^{3.33} / n_v^2) + (D_w / H'_{TS}) * (\theta_{w,v}^{3.33} / n_v^2)$
- (14) $D_{cz}^{eff} = D_a * (\theta_{a,cz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS}) * (\theta_{w,cz}^{3.33} / n_{cz}^2)$
- (15) $\theta_{w,cz} = \theta_{r,cz} + ((\theta_{s,cz} - \theta_{r,cz}) / (2^{M_{cz}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- (16) $\mu_w = \mu_{w-10} * (T'_S / 283.15)^{0.5}$
- (17) $k_{i,v} = K_{s,v} * 1 / \text{Conv02} * \mu_w / (\rho_w * g)$
- (18) $S_{ie} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$
- (19) $k_{rg} = (1 - S_{ie})^{0.5} * (1 - S_{ie}^{1/M_v})^{2M_v}$
- (20) $k_v = k_{i,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- (21) $C_{source} = H'_{TS} * C_R * \text{Conv01} * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * \text{Conv02}$

**TABLE 14
SOILGAS TO OUTDOOR AIR
SACCO**

	Soil EPC	Soil Temp.	Soil Temp.	Henry's Law Constant at ref. temp.	Henry's Law Reference Temp.	Normal Boiling Point	Enthalpy of vaporization at T _S	Critical Temp.	Enthalpy of vaporization constant	Enthalpy of vaporization at T _S	Gas Constant	Henry's Law Constant at T _S	Gas Constant	Henry's Law Constant
	C _R	T _S	T _S	H _R	T _R	T _B	ΔH _{v,B}	T _C	n	ΔH _{v,T_S}	R _c	H _{T_S}	R	H' _{T_S}
Units:	μg/kg	°C	K	atm·m ³ /mol	K	K	cal/mol	K	unitless	cal/mol	cal/mol-K	atm·m ³ /mol	m ³ ·atm/mol-K	unitless
Formula:	Input	(10 for screening)	(T _S +273.15)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)		(Note 9)		H _{T_S} / (R * T _S)
Analyte														
1,2,4-Trimethylbenzene	Not used	1.00E+01	2.83E+02	6.16E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	6.16E-03	8.21E-05	2.65E-01
1,3-Butadiene	Not used	1.00E+01	2.83E+02	4.94E-02	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	4.94E-02	8.21E-05	2.13E+00
4-Ethyltoluene	Not used	1.00E+01	2.83E+02	5.00E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	5.00E-03	8.21E-05	2.15E-01
Acetone	Not used	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	1.97E-05	8.21E-05	8.50E-04
Benzene	Not used	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	2.68E-03	8.21E-05	1.16E-01
Carbon Disulfide	Not used	1.00E+01	2.83E+02	3.02E-02	2.98E+02	3.19E+02	6.39E+03	5.52E+02	3.12E-01	6.68E+03	1.99E+00	1.66E-02	8.21E-05	7.15E-01
Chloroform	Not used	1.00E+01	2.83E+02	3.66E-03	2.98E+02	3.34E+02	6.99E+03	5.36E+02	3.45E-01	7.55E+03	1.99E+00	1.86E-03	8.21E-05	8.02E-02
Chloromethane	Not used	1.00E+01	2.83E+02	8.21E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	8.21E-03	8.21E-05	3.53E-01
Dichlorodifluoromethane	Not used	1.00E+01	2.83E+02	3.90E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	3.90E-01	8.21E-05	1.68E+01
Ethylbenzene	Not used	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	3.18E-03	8.21E-05	1.37E-01
n-Hexane	Not used	1.00E+01	2.83E+02	1.67E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.67E+00	8.21E-05	7.17E+01
Toluene	Not used	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	2.93E-03	8.21E-05	1.26E-01
Xylene, m/p-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01
Xylene, o-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01

TABLE 14 (continued)
SOILGAS TO OUTDOOR AIR
SACCO

	Conversion Factor µg/kg to g/g	SCS soil type in vadose zone ST _v	Vadose zone soil dry bulk density ρ _b	Vadose zone soil water-filled porosity θ _{w,v}	Organic carbon partition coefficient K _{oc}	Vadose zone organic carbon fraction f _{oc,v}	Soil-water partition coefficient K _d	Vadose zone soil total porosity n _v	Vadose zone soil air-filled porosity θ _{a,v}	Conversion Factor g/cm ³ to µg/m ³	Source Vapor Conc. C _{source}
	Units: µg/kg / g/g	unitless	g/cm ³	cm ³ /cm ³	cm ³ /g	unitless	cm ³ /g	cm ³ /cm ³	cm ³ /cm ³	g/cm ³ / µg/m ³	µg/m ³
	Formula:	(Note 11)	(1.5 for screening)	(0.3 for screening)	lookup	(0.002 for screening)	K _{oc} * f _{oc}	(0.43 for screening)	n _v - θ _{w,v}	Conv03	(Input)
					not used	not used	not used				
Analyte											
1,2,4-Trimethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	3.70E+03	2.00E-03	7.41E+00	4.30E-01	1.30E-01	1.00E+12	3.30E+00
1,3-Butadiene	1.00E-09	SCL	1.50E+00	3.00E-01	6.91E+01	2.00E-03	1.38E-01	4.30E-01	1.30E-01	1.00E+12	3.10E+00
4-Ethyltoluene	1.00E-09	SCL	1.50E+00	3.00E-01	5.12E+03	2.00E-03	1.02E+01	4.30E-01	1.30E-01	1.00E+12	2.50E+00
Acetone	1.00E-09	SCL	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	4.80E+01
Benzene	1.00E-09	SCL	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	2.40E+00
Carbon Disulfide	1.00E-09	SCL	1.50E+00	3.00E-01	4.57E+01	2.00E-03	9.14E-02	4.30E-01	1.30E-01	1.00E+12	3.40E+00
Chloroform	1.00E-09	SCL	1.50E+00	3.00E-01	3.98E+01	2.00E-03	7.96E-02	4.30E-01	1.30E-01	1.00E+12	2.50E+00
Chloromethane	1.00E-09	SCL	1.50E+00	3.00E-01	7.72E+01	2.00E-03	1.54E-01	4.30E-01	1.30E-01	1.00E+12	1.40E+00
Dichlorodifluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.63E+02	2.00E-03	7.26E-01	4.30E-01	1.30E-01	1.00E+12	4.00E+00
Ethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	2.60E+00
n-Hexane	1.00E-09	SCL	1.50E+00	3.00E-01	4.80E+02	2.00E-03	9.61E-01	4.30E-01	1.30E-01	1.00E+12	2.00E+00
Toluene	1.00E-09	SCL	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	7.90E+00
Xylene, m/p-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	7.80E+00
Xylene, o-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	2.70E+00

TABLE 14 (continued)
SOILGAS TO OUTDOOR AIR
SACCO

	Depth below grade to bottom of trench	Depth below grade to contamination	Source Trench Separation	Diffusivity in air	Diffusivity in water	Vadose zone Effective Diffusion Coeff.	Total Overall Effective Diffusion Coeff.	Area of Trench Below Grade	Trench Ventilation Rate	Pressure Diff. between soil & enclosed space	Vadose zone soil saturated hydraulic conductivity
	L_F	L_t	L_T	D_a	D_w	D_v^{eff}	D_T^{eff}	A_B	Q_{trench}	ΔP	$K_{s,v}$
Units:	cm	cm	cm	cm ² /s	cm ² /s	cm ² /s	cm ² /s	cm ²	cm ³ /s	g/cm-s ²	cm/hr
Formula:	(120 (4') for screening)	(400 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(Note 22)	(40 for screening)	lookup
Analyte											
1,2,4-Trimethylbenzene	1.20E+02	4.00E+02	2.80E+02	6.02E-02	8.67E-06	3.68E-04	3.68E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
1,3-Butadiene	1.20E+02	4.00E+02	2.80E+02	2.49E-01	1.08E-05	1.51E-03	1.51E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
4-Ethyltoluene	1.20E+02	4.00E+02	2.80E+02	6.49E-02	7.84E-06	3.97E-04	3.97E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Acetone	1.20E+02	4.00E+02	2.80E+02	1.24E-01	1.14E-05	2.07E-03	2.07E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Benzene	1.20E+02	4.00E+02	2.80E+02	8.80E-02	9.80E-06	5.42E-04	5.42E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Carbon Disulfide	1.20E+02	4.00E+02	2.80E+02	1.04E-01	1.00E-05	6.32E-04	6.32E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Chloroform	1.20E+02	4.00E+02	2.80E+02	1.04E-01	1.00E-05	6.43E-04	6.43E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Chloromethane	1.20E+02	4.00E+02	2.80E+02	1.26E-01	6.50E-06	7.65E-04	7.65E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Dichlorodifluoromethane	1.20E+02	4.00E+02	2.80E+02	6.65E-02	9.92E-06	4.03E-04	4.03E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Ethylbenzene	1.20E+02	4.00E+02	2.80E+02	7.50E-02	7.80E-06	4.60E-04	4.60E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
n-Hexane	1.20E+02	4.00E+02	2.80E+02	2.00E-01	7.77E-06	1.21E-03	1.21E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Toluene	1.20E+02	4.00E+02	2.80E+02	8.70E-02	8.60E-06	5.34E-04	5.34E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Xylene, m/p-	1.20E+02	4.00E+02	2.80E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Xylene, o-	1.20E+02	4.00E+02	2.80E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01

TABLE 14 (continued)
SOILGAS TO OUTDOOR AIR
SACCO

	Conversion Factor hr to s Conv02 Units: Formula:	Viscosity of water at 10°C μ_{w-10} g/cm-s	Viscosity of water at system temp. μ_w g/cm-s (Note 16)	Density of water ρ_w g/cm ³ (0.999 for screening)	Acceleration due to gravity g cm/s ²	Vadose zone soil intrinsic permeability $k_{i,v}$ cm ² (Note 17)	Vadose zone residual soil water content $\theta_{r,v}$ cm ³ /cm ³ lookup	Vadose zone effective total fluid saturation S_{te} unitless (Note 18)	Vadose zone van Genuchten shape parameter M_v unitless lookup	Vadose zone soil relative air permeability k_{rg} unitless (Note 19)	Vadose zone soil effective vapor permeability k_v cm ² (Note 20)
Analyte											
1,2,4-Trimethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
1,3-Butadiene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
4-Ethyltoluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Acetone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Benzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Carbon Disulfide	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloroform	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Dichlorodifluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Ethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Hexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Toluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, m/p-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, o-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09

TABLE 14 (continued)
SOILGAS TO OUTDOOR AIR
SACCO

	Thickness of soil between soilgas & trench	Vapor viscosity at avg. soil temp.	Avg. Vapor Flow Rate Into trench	Infinite Source Attenuation Coeff.	Infinite Source Trench Conc.
	L_{soil}	μ_{TS}	Q_{soil}	α	C_{trench}
Units:	cm	g/cm-s	cm ³ /s	unitless	µg/m ³
Formula:	(1 for screening)	$0.00018*(T_s/298.15)^{0.5}$	(Note 5)	(Note 6)	$C_{source} * \alpha$
Analyte					
1,2,4-Trimethylbenzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	4.89E-09
1,3-Butadiene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	4.60E-09
4-Ethyltoluene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	3.71E-09
Acetone	1.00E+00	1.75E-04	2.52E-04	1.48E-09	7.12E-08
Benzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	3.56E-09
Carbon Disulfide	1.00E+00	1.75E-04	2.52E-04	1.48E-09	5.04E-09
Chloroform	1.00E+00	1.75E-04	2.52E-04	1.48E-09	3.71E-09
Chloromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.08E-09
Dichlorodifluoromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	5.93E-09
Ethylbenzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	3.85E-09
n-Hexane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.97E-09
Toluene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.17E-08
Xylene, m/p-	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.16E-08
Xylene, o-	1.00E+00	1.75E-04	2.52E-04	1.48E-09	4.00E-09

TABLE 14 (continued)
SOILGAS TO OUTDOOR AIR
SACCO

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- (1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- (2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.
- (3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.
- (4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$
- (5) $Q_{soil} = (2 * \pi * \Delta P * k_v * X_{crack}) / (\mu_{TS} * \ln(2 * Z_{crack} / r_{crack}))$
- (6) $\alpha = [(D_T^{eff} * A_B / (Q_{building} * L_T)) * \text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack}))] / [\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) + (D_T^{eff} * A_B / (Q_{building} * L_T)) + (D_T^{eff} * A_B / (Q_{soil} * L_T)) * (\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) - 1)]$
- (7) A function of the ratio T_B/T_C :

T_B/T_C	α
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C) - 0.116$
>0.71	0.41
- (8) $\Delta H_{v,TS} = \Delta H_{v,B} * [(1 - T_S/T_C) / (1 - T_B/T_C)]^0.5$
- (9) $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_c * (1/T_S - 1/T_R)] * H_R$
- (10) Refer to 12 SCS soil types - use SC for screening.
- (11) Refer to 12 SCS soil types - use SCL for screening.
- (12) $L_{cz} = 0.15 / (0.2 * D_{cz})$
- (13) $D_v^{eff} = D_a * (\theta_{a,v}^{3.33} / n_v^2) + (D_w / H'_{TS}) * (\theta_{w,v}^{3.33} / n_v^2)$
- (14) $D_{cz}^{eff} = D_a * (\theta_{a,cz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS}) * (\theta_{w,cz}^{3.33} / n_{cz}^2)$
- (15) $\theta_{w,cz} = \theta_{r,cz} + ((\theta_{s,cz} - \theta_{r,cz}) / (2^{M_{cz}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- (16) $\mu_w = \mu_{w-10} * (\Gamma'_S / 283.15)^{0.5}$
- (17) $k_{i,v} = K_{s,v} * 1/Conv02 * \mu_w / (\rho_w * g)$
- (18) $S_{ie} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$
- (19) $k_{rg} = (1 - S_{ie})^{0.5} * (1 - S_{ie}^{1/M_v})^{2M_v}$
- (20) $k_v = k_{i,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- (21) $C_{source} = H'_{TS} * C_R * Conv01 * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * Conv02$
- (22) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

**TABLE 15
SOILGAS TO INDOOR AIR
TERADYNE**

	Soil EPC C_R Units: $\mu\text{g}/\text{kg}$ Formula: Input	Soil Temp. T_S $^{\circ}\text{C}$ (10 for screening)	Soil Temp. T'_S K ($T_S + 273.15$)	Henry's Law Constant at ref. temp. H_R $\text{atm}\cdot\text{m}^3/\text{mol}$ lookup	Henry's Law Reference Temp. T_R K (lookup+273.15)	Normal Boiling Point T_B K lookup	Enthalpy of vaporization at T_S $\Delta H_{v,B}$ cal/mol lookup	Critical Temp. T_C K lookup	constant n unitless (Note 7)	Enthalpy of vaporization at T_S $\Delta H_{v,TS}$ cal/mol (Note 8)	Gas Constant R_c cal/mol-K	Henry's Law Constant at T_S H_{TS} $\text{atm}\cdot\text{m}^3/\text{mol}$ (Note 9)	Gas Constant R $\text{m}^3\cdot\text{atm}/\text{mol}\cdot\text{K}$	Henry's Law Constant H'_{TS} unitless $H_{TS} / (R * T_S)$
Analyte														
1,2,4-Trimethylbenzene	Not used	1.00E+01	2.83E+02	6.16E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	6.16E-03	8.21E-05	2.65E-01
2-Butanone	Not used	1.00E+01	2.83E+02	2.74E-05	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	2.74E-05	8.21E-05	1.18E-03
4-Ethyltoluene	Not used	1.00E+01	2.83E+02	5.00E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	5.00E-03	8.21E-05	2.15E-01
Acetone	Not used	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	1.97E-05	8.21E-05	8.50E-04
Benzene	Not used	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	2.68E-03	8.21E-05	1.16E-01
Carbon Disulfide	Not used	1.00E+01	2.83E+02	3.02E-02	2.98E+02	3.19E+02	6.39E+03	5.52E+02	3.12E-01	6.68E+03	1.99E+00	1.66E-02	8.21E-05	7.15E-01
Chloroethane	Not used	1.00E+01	2.83E+02	1.12E-02	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.12E-02	8.21E-05	4.84E-01
Chloromethane	Not used	1.00E+01	2.83E+02	8.21E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	8.21E-03	8.21E-05	3.53E-01
Cyclohexane	Not used	1.00E+01	2.83E+02	4.55E-02	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	4.55E-02	8.21E-05	1.96E+00
Dichlorodifluoromethane	Not used	1.00E+01	2.83E+02	3.90E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	3.90E-01	8.21E-05	1.68E+01
Ethylbenzene	Not used	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	3.18E-03	8.21E-05	1.37E-01
Isopropyl Alcohol	Not used	1.00E+01	2.83E+02	7.69E-06	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.69E-06	8.21E-05	3.31E-04
Methylene Chloride	Not used	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	1.17E-03	8.21E-05	5.03E-02
n-Heptane	Not used	1.00E+01	2.83E+02	2.70E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	2.70E+00	8.21E-05	1.16E+02
n-Hexane	Not used	1.00E+01	2.83E+02	1.67E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.67E+00	8.21E-05	7.17E+01
Styrene	Not used	1.00E+01	2.83E+02	2.76E-03	2.98E+02	4.18E+02	8.74E+03	6.36E+02	3.71E-01	1.05E+04	1.99E+00	1.08E-03	8.21E-05	4.67E-02
Toluene	Not used	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	2.93E-03	8.21E-05	1.26E-01
Trichloroethene	Not used	1.00E+01	2.83E+02	1.03E-02	2.98E+02	3.60E+02	7.51E+03	5.44E+02	3.74E-01	8.56E+03	1.99E+00	4.79E-03	8.21E-05	2.06E-01
Trichlorofluoromethane	Not used	1.00E+01	2.83E+02	1.00E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.00E-01	8.21E-05	4.30E+00
Xylene, m/p-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01
Xylene, o-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01

**TABLE 15 (continued)
SOILGAS TO INDOOR AIR
TERADYNE**

	Conversion Factor $\mu\text{g}/\text{kg}$ to g/g Conv01 Units: $\mu\text{g}/\text{kg}$ / g/g Formula:	SCS soil type in vadose zone ST_v unitless (Note 11)	Vadose zone soil dry bulk density ρ_b g/cm^3 (1.5 for screening)	Vadose zone soil water-filled porosity $\theta_{w,v}$ cm^3/cm^3 (0.3 for screening)	Organic carbon partition coefficient K_{oc} cm^3/g lookup not used	Vadose zone organic carbon fraction $f_{oc,v}$ unitless (0.002 for screening) not used	Soil-water partition coefficient K_d cm^3/g not used	Vadose zone soil total porosity n_v cm^3/cm^3 (0.43 for screening)	Vadose zone soil air-filled porosity $\theta_{a,v}$ cm^3/cm^3 $n_v - \theta_{w,v}$	Conversion Factor g/cm^3 to $\mu\text{g}/\text{m}^3$ Conv03 g/cm^3 / $\mu\text{g}/\text{m}^3$	Source Vapor Conc. C_{source} $\mu\text{g}/\text{m}^3$ (Input)
Analyte											
1,2,4-Trimethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	3.70E+03	2.00E-03	7.41E+00	4.30E-01	1.30E-01	1.00E+12	3.35E+00
2-Butanone	1.00E-09	SCL	1.50E+00	3.00E-01	3.50E+00	2.00E-03	7.00E-03	4.30E-01	1.30E-01	1.00E+12	5.90E+00
4-Ethyltoluene	1.00E-09	SCL	1.50E+00	3.00E-01	5.12E+03	2.00E-03	1.02E+01	4.30E-01	1.30E-01	1.00E+12	2.60E+00
Acetone	1.00E-09	SCL	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	7.85E+01
Benzene	1.00E-09	SCL	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	2.60E+00
Carbon Disulfide	1.00E-09	SCL	1.50E+00	3.00E-01	4.57E+01	2.00E-03	9.14E-02	4.30E-01	1.30E-01	1.00E+12	4.65E+00
Chloroethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.24E+00	2.00E-03	6.47E-03	4.30E-01	1.30E-01	1.00E+12	1.55E+00
Chloromethane	1.00E-09	SCL	1.50E+00	3.00E-01	7.72E+01	2.00E-03	1.54E-01	4.30E-01	1.30E-01	1.00E+12	1.30E+00
Cyclohexane	1.00E-09	SCL	1.50E+00	3.00E-01	3.07E+02	2.00E-03	6.14E-01	4.30E-01	1.30E-01	1.00E+12	5.90E+00
Dichlorodifluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.63E+02	2.00E-03	7.26E-01	4.30E-01	1.30E-01	1.00E+12	3.00E+00
Ethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	5.20E+00
Isopropyl Alcohol	1.00E-09	SCL	1.50E+00	3.00E-01	6.97E-01	2.00E-03	1.39E-03	4.30E-01	1.30E-01	1.00E+12	7.50E+01
Methylene Chloride	1.00E-09	SCL	1.50E+00	3.00E-01	1.17E+01	2.00E-03	2.34E-02	4.30E-01	1.30E-01	1.00E+12	1.33E+00
n-Heptane	1.00E-09	SCL	1.50E+00	3.00E-01	1.28E+03	2.00E-03	2.57E+00	4.30E-01	1.30E-01	1.00E+12	3.25E+01
n-Hexane	1.00E-09	SCL	1.50E+00	3.00E-01	4.80E+02	2.00E-03	9.61E-01	4.30E-01	1.30E-01	1.00E+12	6.50E+00
Styrene	1.00E-09	SCL	1.50E+00	3.00E-01	7.76E+02	2.00E-03	1.55E+00	4.30E-01	1.30E-01	1.00E+12	6.85E+00
Toluene	1.00E-09	SCL	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	2.55E+01
Trichloroethene	1.00E-09	SCL	1.50E+00	3.00E-01	1.66E+02	2.00E-03	3.32E-01	4.30E-01	1.30E-01	1.00E+12	2.45E+01
Trichlorofluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	1.58E+02	2.00E-03	3.17E-01	4.30E-01	1.30E-01	1.00E+12	4.60E+01
Xylene, m/p-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	2.00E+01
Xylene, o-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	6.10E+00

TABLE 15 (continued)
SOILGAS TO INDOOR AIR
TERADYNE

	Depth below grade to bottom of enclosed space L_F	Depth below grade to contamination L_t	Source Building Separation L_T	Diffusivity in air D_a	Diffusivity in water D_w	Vadose zone Effective Diffusion Coeff. D_v^{eff}	Total Overall Effective Diffusion Coeff. D_T^{eff}	Area of Enclosed Space Below Grade A_B	Building Ventilation Rate $Q_{building}$	Pressure Diff. between soil & enclosed space ΔP	Vadose zone soil saturated hydraulic conductivity $K_{s,v}$
Units:	cm	cm	cm	cm ² /s	cm ² /s	cm ² /s	cm ² /s	cm ²	cm ³ /s	g/cm-s ²	cm/hr
Formula:	(15 or 200 for screening)	(400 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(56335 for screening)	(40 for screening)	lookup
Analyte											
1,2,4-Trimethylbenzene	2.00E+02	4.00E+02	2.00E+02	6.02E-02	8.67E-06	3.68E-04	3.68E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
2-Butanone	2.00E+02	4.00E+02	2.00E+02	8.08E-02	9.80E-06	1.31E-03	1.31E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
4-Ethyltoluene	2.00E+02	4.00E+02	2.00E+02	6.49E-02	7.84E-06	3.97E-04	3.97E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Acetone	2.00E+02	4.00E+02	2.00E+02	1.24E-01	1.14E-05	2.07E-03	2.07E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Benzene	2.00E+02	4.00E+02	2.00E+02	8.80E-02	9.80E-06	5.42E-04	5.42E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Carbon Disulfide	2.00E+02	4.00E+02	2.00E+02	1.04E-01	1.00E-05	6.32E-04	6.32E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Chloroethane	2.00E+02	4.00E+02	2.00E+02	2.71E-01	1.15E-05	1.64E-03	1.64E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Chloromethane	2.00E+02	4.00E+02	2.00E+02	1.26E-01	6.50E-06	7.65E-04	7.65E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Cyclohexane	2.00E+02	4.00E+02	2.00E+02	8.39E-02	9.10E-06	5.09E-04	5.09E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Dichlorodifluoromethane	2.00E+02	4.00E+02	2.00E+02	6.65E-02	9.92E-06	4.03E-04	4.03E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Ethylbenzene	2.00E+02	4.00E+02	2.00E+02	7.50E-02	7.80E-06	4.60E-04	4.60E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Isopropyl Alcohol	2.00E+02	4.00E+02	2.00E+02	9.80E-02	1.04E-05	3.68E-03	3.68E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Methylene Chloride	2.00E+02	4.00E+02	2.00E+02	1.01E-01	1.17E-05	6.35E-04	6.35E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
n-Heptane	2.00E+02	4.00E+02	2.00E+02	9.26E-02	7.59E-06	5.61E-04	5.61E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
n-Hexane	2.00E+02	4.00E+02	2.00E+02	2.00E-01	7.77E-06	1.21E-03	1.21E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Styrene	2.00E+02	4.00E+02	2.00E+02	7.10E-02	8.00E-06	4.47E-04	4.47E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Toluene	2.00E+02	4.00E+02	2.00E+02	8.70E-02	8.60E-06	5.34E-04	5.34E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Trichloroethene	2.00E+02	4.00E+02	2.00E+02	7.90E-02	9.10E-06	4.83E-04	4.83E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Trichlorofluoromethane	2.00E+02	4.00E+02	2.00E+02	8.70E-02	9.70E-06	5.27E-04	5.27E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Xylene, m/p-	2.00E+02	4.00E+02	2.00E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Xylene, o-	2.00E+02	4.00E+02	2.00E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01

TABLE 15 (continued)
SOILGAS TO INDOOR AIR
TERADYNE

	Conversion Factor hr to s Conv02 Units: Formula:	Viscosity of water at 10°C μ _{w-10} g/cm-s	Viscosity of water at system temp. μ _w g/cm-s (Note 16)	Density of water ρ _w g/cm ³ (0.999 for screening)	Acceleration due to gravity g cm/s ²	Vadose zone soil intrinsic permeability k _{i,v} cm ² (Note 17)	Vadose zone residual soil water content θ _{r,v} cm ³ /cm ³ lookup	Vadose zone effective total fluid saturation S _{te} unitless (Note 18)	Vadose zone van Genuchten shape parameter M _v unitless lookup	Vadose zone soil relative air permeability k _{rg} unitless (Note 19)	Vadose zone soil effective vapor permeability k _v cm ² (Note 20)
Analyte											
1,2,4-Trimethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
2-Butanone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
4-Ethyltoluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Acetone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Benzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Carbon Disulfide	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloroethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Cyclohexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Dichlorodifluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Ethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Isopropyl Alcohol	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Methylene Chloride	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Heptane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Hexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Styrene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Toluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Trichloroethene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Trichlorofluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, m/p-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, o-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09

TABLE 15 (continued)
SOILGAS TO INDOOR AIR
TERADYNE

	Floor-wall seam perimeter X_{crack} Units: cm Formula: (3844 for screening)	Vapor viscosity at avg. soil temp. μ_{TS} g/cm-s $0.00018*(T_g/298.15)^{0.5}$	Crack depth below grade Z_{crack} cm (= L_F for screening)	Total area of cracks A_{crack} cm ² (384 for screening)	Crack-to-total area ratio η unitless A_{crack}/A_B	Equivalent crack radius r_{crack} cm $\eta(A_B/X_{crack})$	Avg. Vapor Flow Rate Into Bldg. Q_{soil} cm ³ /s (Note 5)	Foundation or Slab Thickness L_{crack} cm (15 for screening)	Crack Effective Diffusion Coeff. D^{crack} cm ² /s (Note 1)	Infinite Source Indoor Attenuation Coeff. α unitless (Note 6)	Infinite Source Bldg. Conc. $C_{building}$ $\mu\text{g}/\text{m}^3$ $C_{source} * \alpha$
Analyte											
1,2,4-Trimethylbenzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	3.68E-04	1.05E-05	3.53E-05
2-Butanone	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	1.31E-03	1.22E-05	7.20E-05
4-Ethyltoluene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	3.97E-04	1.07E-05	2.78E-05
Acetone	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	2.07E-03	1.25E-05	9.81E-04
Benzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.42E-04	1.12E-05	2.92E-05
Carbon Disulfide	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	6.32E-04	1.15E-05	5.32E-05
Chloroethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	1.64E-03	1.24E-05	1.92E-05
Chloromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	7.65E-04	1.17E-05	1.52E-05
Cyclohexane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.09E-04	1.11E-05	6.56E-05
Dichlorodifluoromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.03E-04	1.07E-05	3.22E-05
Ethylbenzene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.60E-04	1.10E-05	5.70E-05
Isopropyl Alcohol	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	3.68E-03	1.27E-05	9.55E-04
Methylene Chloride	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	6.35E-04	1.15E-05	1.52E-05
n-Heptane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.61E-04	1.13E-05	3.67E-04
n-Hexane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	1.21E-03	1.22E-05	7.90E-05
Styrene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.47E-04	1.09E-05	7.47E-05
Toluene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.34E-04	1.12E-05	2.86E-04
Trichloroethene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.83E-04	1.10E-05	2.70E-04
Trichlorofluoromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.27E-04	1.12E-05	5.14E-04
Xylene, m/p-	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.73E-04	1.10E-05	2.20E-04
Xylene, o-	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.73E-04	1.10E-05	6.71E-05

TABLE 15 (continued)
SOILGAS TO INDOOR AIR
TERADYNE

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- (1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- (2) For screening, $A_B = 923,521 \text{ cm}^2$ for $L_F = 15 \text{ cm}$ and $A_B = 1,692,321 \text{ cm}^2$ for $L_F = 200 \text{ cm}$
- (3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.
- (4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$
- (5) $Q_{soil} = (2 * \pi * \Delta P * k_v * X_{crack}) / (\mu_{TS} * \ln(2 * Z_{crack} / r_{crack}))$
- (6) $\alpha = [(D_T^{eff} * A_B / (Q_{building} * L_T)) * \text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack}))] / [\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) + (D_T^{eff} * A_B / (Q_{building} * L_T)) + (D_T^{eff} * A_B / (Q_{soil} * L_T)) * (\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) - 1)]$
- (7) A function of the ratio T_B/T_C :

T_B/T_C	α
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C) - 0.116$
>0.71	0.41
- (8) $\Delta H_{v,TS} = \Delta H_{v,B} * [(1 - T_S/T_C) / (1 - T_B/T_C)]^n$
- (9) $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_c * (1/T_S - 1/T_R)] * H_R$; or taken from lookup table.
- (10) Refer to 12 SCS soil types - use SC for screening.
- (11) Refer to 12 SCS soil types - use SCL for screening.
- (12) $L_{cz} = 0.15 / (0.2 * D_{cz})$
- (13) $D_v^{eff} = D_a * (\theta_{a,v}^{3.33} / n_v^2) + (D_w / H'_{TS}) * (\theta_{w,v}^{3.33} / n_v^2)$
- (14) $D_{cz}^{eff} = D_a * (\theta_{a,cz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS}) * (\theta_{w,cz}^{3.33} / n_{cz}^2)$
- (15) $\theta_{w,cz} = \theta_{r,cz} + ((\theta_{s,cz} - \theta_{r,cz}) / (2^{M_{cz}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- (16) $\mu_w = \mu_{w-10} * (T'_S / 283.15)^{0.5}$
- (17) $k_{i,v} = K_{s,v} * 1 / \text{Conv}02 * \mu_w / (\rho_w * g)$
- (18) $S_{ie} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$
- (19) $k_{rg} = (1 - S_{ie})^{0.5} * (1 - S_{ie}^{1/M_v, 2M_v})$
- (20) $k_v = k_{i,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- (21) $C_{source} = H'_{TS} * C_R * \text{Conv}01 * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * \text{Conv}02$

**TABLE 16
SOILGAS TO OUTDOOR AIR
TERADYNE**

	Soil EPC	Soil Temp.	Soil Temp.	Henry's Law Constant at ref. temp.	Henry's Law Reference Temp.	Normal Boiling Point	Enthalpy of vaporization at T _S	Critical Temp.	Enthalpy of vaporization constant	Enthalpy of vaporization at T _S	Gas Constant	Henry's Law Constant at T _S	Gas Constant	Henry's Law Constant
	C _R	T _S	T' _S	H _R	T _R	T _B	ΔH _{v,B}	T _C	n	ΔH _{v,T_S}	R _c	H _{T_S}	R	H' _{T_S}
Units:	μg/kg	°C	K	atm·m ³ /mol	K	K	cal/mol	K	unitless	cal/mol	cal/mol-K	atm·m ³ /mol	m ³ ·atm/mol-K	unitless
Formula:	Input	(10 for screening)	(T _S +273.15)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)		(Note 9)		H _{T_S} / (R * T' _S)
Analyte														
1,2,4-Trimethylbenzene	Not used	1.00E+01	2.83E+02	6.16E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	6.16E-03	8.21E-05	2.65E-01
2-Butanone	Not used	1.00E+01	2.83E+02	2.74E-05	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	2.74E-05	8.21E-05	1.18E-03
4-Ethyltoluene	Not used	1.00E+01	2.83E+02	5.00E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	5.00E-03	8.21E-05	2.15E-01
Acetone	Not used	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	1.97E-05	8.21E-05	8.50E-04
Benzene	Not used	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	2.68E-03	8.21E-05	1.16E-01
Carbon Disulfide	Not used	1.00E+01	2.83E+02	3.02E-02	2.98E+02	3.19E+02	6.39E+03	5.52E+02	3.12E-01	6.68E+03	1.99E+00	1.66E-02	8.21E-05	7.15E-01
Chloroethane	Not used	1.00E+01	2.83E+02	1.12E-02	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.12E-02	8.21E-05	4.84E-01
Chloromethane	Not used	1.00E+01	2.83E+02	8.21E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	8.21E-03	8.21E-05	3.53E-01
Cyclohexane	Not used	1.00E+01	2.83E+02	4.55E-02	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	4.55E-02	8.21E-05	1.96E+00
Dichlorodifluoromethane	Not used	1.00E+01	2.83E+02	3.90E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	3.90E-01	8.21E-05	1.68E+01
Ethylbenzene	Not used	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	3.18E-03	8.21E-05	1.37E-01
Isopropyl Alcohol	Not used	1.00E+01	2.83E+02	7.69E-06	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.69E-06	8.21E-05	3.31E-04
Methylene Chloride	Not used	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	1.17E-03	8.21E-05	5.03E-02
n-Heptane	Not used	1.00E+01	2.83E+02	2.70E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	2.70E+00	8.21E-05	1.16E+02
n-Hexane	Not used	1.00E+01	2.83E+02	1.67E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.67E+00	8.21E-05	7.17E+01
Styrene	Not used	1.00E+01	2.83E+02	2.76E-03	2.98E+02	4.18E+02	8.74E+03	6.36E+02	3.71E-01	1.05E+04	1.99E+00	1.08E-03	8.21E-05	4.67E-02
Toluene	Not used	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	2.93E-03	8.21E-05	1.26E-01
Trichloroethene	Not used	1.00E+01	2.83E+02	1.03E-02	2.98E+02	3.60E+02	7.51E+03	5.44E+02	3.74E-01	8.56E+03	1.99E+00	4.79E-03	8.21E-05	2.06E-01
Trichlorofluoromethane	Not used	1.00E+01	2.83E+02	1.00E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.00E-01	8.21E-05	4.30E+00
Xylene, m/p-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01
Xylene, o-	Not used	1.00E+01	2.83E+02	6.73E-03	2.98E+02	4.12E+02	8.53E+03	6.16E+02	3.78E-01	1.02E+04	1.99E+00	2.69E-03	8.21E-05	1.16E-01

TABLE 16 (continued)
SOILGAS TO OUTDOOR AIR
TERADYNE

	Conversion Factor $\mu\text{g}/\text{kg}$ to g/g Conv01 Units: $\mu\text{g}/\text{kg}$ / g/g Formula:	SCS soil type in vadose zone ST _v unitless (Note 11)	Vadose zone soil dry bulk density ρ_b g/cm^3 (1.5 for screening)	Vadose zone soil water-filled porosity $\theta_{w,v}$ cm^3/cm^3 (0.3 for screening)	Organic carbon partition coefficient K _{oc} cm^3/g lookup not used	Vadose zone organic carbon fraction f _{oc,v} unitless (0.002 for screening) not used	Soil-water partition coefficient K _d cm^3/g not used	Vadose zone soil total porosity n _v cm^3/cm^3 (0.43 for screening)	Vadose zone soil air-filled porosity $\theta_{a,v}$ cm^3/cm^3 n _v - $\theta_{w,v}$	Conversion Factor g/cm^3 to $\mu\text{g}/\text{m}^3$ Conv03 g/cm^3 / $\mu\text{g}/\text{m}^3$	Source Vapor Conc. C _{source} $\mu\text{g}/\text{m}^3$ (Input)
Analyte											
1,2,4-Trimethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	3.70E+03	2.00E-03	7.41E+00	4.30E-01	1.30E-01	1.00E+12	3.35E+00
2-Butanone	1.00E-09	SCL	1.50E+00	3.00E-01	3.50E+00	2.00E-03	7.00E-03	4.30E-01	1.30E-01	1.00E+12	5.90E+00
4-Ethyltoluene	1.00E-09	SCL	1.50E+00	3.00E-01	5.12E+03	2.00E-03	1.02E+01	4.30E-01	1.30E-01	1.00E+12	2.60E+00
Acetone	1.00E-09	SCL	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	7.85E+01
Benzene	1.00E-09	SCL	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	2.60E+00
Carbon Disulfide	1.00E-09	SCL	1.50E+00	3.00E-01	4.57E+01	2.00E-03	9.14E-02	4.30E-01	1.30E-01	1.00E+12	4.65E+00
Chloroethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.24E+00	2.00E-03	6.47E-03	4.30E-01	1.30E-01	1.00E+12	1.55E+00
Chloromethane	1.00E-09	SCL	1.50E+00	3.00E-01	7.72E+01	2.00E-03	1.54E-01	4.30E-01	1.30E-01	1.00E+12	1.30E+00
Cyclohexane	1.00E-09	SCL	1.50E+00	3.00E-01	3.07E+02	2.00E-03	6.14E-01	4.30E-01	1.30E-01	1.00E+12	5.90E+00
Dichlorodifluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.63E+02	2.00E-03	7.26E-01	4.30E-01	1.30E-01	1.00E+12	3.00E+00
Ethylbenzene	1.00E-09	SCL	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	5.20E+00
Isopropyl Alcohol	1.00E-09	SCL	1.50E+00	3.00E-01	6.97E-01	2.00E-03	1.39E-03	4.30E-01	1.30E-01	1.00E+12	7.50E+01
Methylene Chloride	1.00E-09	SCL	1.50E+00	3.00E-01	1.17E+01	2.00E-03	2.34E-02	4.30E-01	1.30E-01	1.00E+12	1.33E+00
n-Heptane	1.00E-09	SCL	1.50E+00	3.00E-01	1.28E+03	2.00E-03	2.57E+00	4.30E-01	1.30E-01	1.00E+12	3.25E+01
n-Hexane	1.00E-09	SCL	1.50E+00	3.00E-01	4.80E+02	2.00E-03	9.61E-01	4.30E-01	1.30E-01	1.00E+12	6.50E+00
Styrene	1.00E-09	SCL	1.50E+00	3.00E-01	7.76E+02	2.00E-03	1.55E+00	4.30E-01	1.30E-01	1.00E+12	6.85E+00
Toluene	1.00E-09	SCL	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	2.55E+01
Trichloroethene	1.00E-09	SCL	1.50E+00	3.00E-01	1.66E+02	2.00E-03	3.32E-01	4.30E-01	1.30E-01	1.00E+12	2.45E+01
Trichlorofluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	1.58E+02	2.00E-03	3.17E-01	4.30E-01	1.30E-01	1.00E+12	4.60E+01
Xylene, m/p-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	2.00E+01
Xylene, o-	1.00E-09	SCL	1.50E+00	3.00E-01	2.49E+02	2.00E-03	4.99E-01	4.30E-01	1.30E-01	1.00E+12	6.10E+00

TABLE 16 (continued)
SOILGAS TO OUTDOOR AIR
TERADYNE

	Depth below grade to bottom of trench L_F	Depth below grade to contamination L_t	Source Trench Separation L_T	Diffusivity in air D_a	Diffusivity in water D_w	Vadose zone Effective Diffusion Coeff. D_v^{eff}	Total Overall Effective Diffusion Coeff. D_T^{eff}	Area of Trench Below Grade A_B	Trench Ventilation Rate Q_{trench}	Pressure Diff. between soil & enclosed space ΔP	Vadose zone soil saturated hydraulic conductivity $K_{s,v}$
Units:	cm	cm	cm	cm ² /s	cm ² /s	cm ² /s	cm ² /s	cm ²	cm ³ /s	g/cm-s ²	cm/hr
Formula:	(120 (4') for screening)	(400 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(Note 22)	(40 for screening)	lookup
Analyte											
1,2,4-Trimethylbenzene	1.20E+02	4.00E+02	2.80E+02	6.02E-02	8.67E-06	3.68E-04	3.68E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
2-Butanone	1.20E+02	4.00E+02	2.80E+02	8.08E-02	9.80E-06	1.31E-03	1.31E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
4-Ethyltoluene	1.20E+02	4.00E+02	2.80E+02	6.49E-02	7.84E-06	3.97E-04	3.97E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Acetone	1.20E+02	4.00E+02	2.80E+02	1.24E-01	1.14E-05	2.07E-03	2.07E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Benzene	1.20E+02	4.00E+02	2.80E+02	8.80E-02	9.80E-06	5.42E-04	5.42E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Carbon Disulfide	1.20E+02	4.00E+02	2.80E+02	1.04E-01	1.00E-05	6.32E-04	6.32E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Chloroethane	1.20E+02	4.00E+02	2.80E+02	2.71E-01	1.15E-05	1.64E-03	1.64E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Chloromethane	1.20E+02	4.00E+02	2.80E+02	1.26E-01	6.50E-06	7.65E-04	7.65E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Cyclohexane	1.20E+02	4.00E+02	2.80E+02	8.39E-02	9.10E-06	5.09E-04	5.09E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Dichlorodifluoromethane	1.20E+02	4.00E+02	2.80E+02	6.65E-02	9.92E-06	4.03E-04	4.03E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Ethylbenzene	1.20E+02	4.00E+02	2.80E+02	7.50E-02	7.80E-06	4.60E-04	4.60E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Isopropyl Alcohol	1.20E+02	4.00E+02	2.80E+02	9.80E-02	1.04E-05	3.68E-03	3.68E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Methylene Chloride	1.20E+02	4.00E+02	2.80E+02	1.01E-01	1.17E-05	6.35E-04	6.35E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
n-Heptane	1.20E+02	4.00E+02	2.80E+02	9.26E-02	7.59E-06	5.61E-04	5.61E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
n-Hexane	1.20E+02	4.00E+02	2.80E+02	2.00E-01	7.77E-06	1.21E-03	1.21E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Styrene	1.20E+02	4.00E+02	2.80E+02	7.10E-02	8.00E-06	4.47E-04	4.47E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Toluene	1.20E+02	4.00E+02	2.80E+02	8.70E-02	8.60E-06	5.34E-04	5.34E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Trichloroethene	1.20E+02	4.00E+02	2.80E+02	7.90E-02	9.10E-06	4.83E-04	4.83E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Trichlorofluoromethane	1.20E+02	4.00E+02	2.80E+02	8.70E-02	9.70E-06	5.27E-04	5.27E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Xylene, m/p-	1.20E+02	4.00E+02	2.80E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Xylene, o-	1.20E+02	4.00E+02	2.80E+02	7.69E-02	8.44E-06	4.73E-04	4.73E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01

TABLE 16 (continued)
SOILGAS TO OUTDOOR AIR
TERADYNE

	Conversion Factor hr to s Conv02 Units: Formula:	Viscosity of water at 10°C μ_{w-10} g/cm-s	Viscosity of water at system temp. μ_w g/cm-s (Note 16)	Density of water ρ_w g/cm ³ (0.999 for screening)	Acceleration due to gravity g cm/s ²	Vadose zone soil intrinsic permeability $k_{i,v}$ cm ² (Note 17)	Vadose zone residual soil water content $\theta_{r,v}$ cm ³ /cm ³ lookup	Vadose zone effective total fluid saturation S_{te} unitless (Note 18)	Vadose zone van Genuchten shape parameter M_v unitless lookup	Vadose zone soil relative air permeability k_{rg} unitless (Note 19)	Vadose zone soil effective vapor permeability k_v cm ² (Note 20)
Analyte											
1,2,4-Trimethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
2-Butanone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
4-Ethyltoluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Acetone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Benzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Carbon Disulfide	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloroethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Cyclohexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Dichlorodifluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Ethylbenzene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Isopropyl Alcohol	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Methylene Chloride	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Heptane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Hexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Styrene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Toluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Trichloroethene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Trichlorofluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, m/p-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Xylene, o-	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09

TABLE 16 (continued)
SOILGAS TO OUTDOOR AIR
TERADYNE

	Thickness of soil between soilgas & trench	Vapor viscosity at avg. soil temp.	Avg. Vapor Flow Rate Into trench	Infinite Source Attenuation Coeff.	Infinite Source Trench Conc.
	L_{soil}	μ_{TS}	Q_{soil}	α	C_{trench}
Units:	cm	g/cm-s	cm ³ /s	unitless	µg/m ³
Formula:	(1 for screening)	$0.00018*(T_s/298.15)^{0.5}$	(Note 5)	(Note 6)	$C_{source} * \alpha$
Analyte					
1,2,4-Trimethylbenzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	4.96E-09
2-Butanone	1.00E+00	1.75E-04	2.52E-04	1.48E-09	8.75E-09
4-Ethyltoluene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	3.85E-09
Acetone	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.16E-07
Benzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	3.85E-09
Carbon Disulfide	1.00E+00	1.75E-04	2.52E-04	1.48E-09	6.89E-09
Chloroethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.30E-09
Chloromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.93E-09
Cyclohexane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	8.75E-09
Dichlorodifluoromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	4.45E-09
Ethylbenzene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	7.71E-09
Isopropyl Alcohol	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.11E-07
Methylene Chloride	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.96E-09
n-Heptane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	4.82E-08
n-Hexane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	9.64E-09
Styrene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.02E-08
Toluene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	3.78E-08
Trichloroethene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	3.63E-08
Trichlorofluoromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	6.82E-08
Xylene, m/p-	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.96E-08
Xylene, o-	1.00E+00	1.75E-04	2.52E-04	1.48E-09	9.04E-09

TABLE 16 (continued)
SOILGAS TO OUTDOOR AIR
TERADYNE

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- (1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- (2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.
- (3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.
- (4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$
- (5) $Q_{soil} = (2 * \pi * \Delta P * k_v * X_{crack}) / (\mu_{TS} * \ln(2 * Z_{crack} / r_{crack}))$
- (6) $\alpha = [(D_T^{eff} * A_B / (Q_{building} * L_T)) * \text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack}))] / [\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) + (D_T^{eff} * A_B / (Q_{building} * L_T)) + (D_T^{eff} * A_B / (Q_{soil} * L_T)) * (\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) - 1)]$
- (7) A function of the ratio T_B/T_C :

T_B/T_C	α
<0.57	0.30
0.57-0.71	0.74(T_B/T_C)-0.116
>0.71	0.41
- (8) $\Delta H_{v,TS} = \Delta H_{v,B} * [(1 - T_S/T_C) / (1 - T_B/T_C)]^3$
- (9) $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_c * (1/T_S - 1/T_R)] * H_R$
- (10) Refer to 12 SCS soil types - use SC for screening.
- (11) Refer to 12 SCS soil types - use SCL for screening.
- (12) $L_{cz} = 0.15 / (0.2 * D_{cz})$
- (13) $D_v^{eff} = D_a * (\theta_{a,v}^{3.33} / n_v^2) + (D_w / H'_{TS}) * (\theta_{w,v}^{3.33} / n_v^2)$
- (14) $D_{cz}^{eff} = D_a * (\theta_{a,cz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS}) * (\theta_{w,cz}^{3.33} / n_{cz}^2)$
- (15) $\theta_{w,cz} = \theta_{r,cz} + ((\theta_{s,cz} - \theta_{r,cz}) / (2^{M_{cz}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- (16) $\mu_w = \mu_{w-10} * (\Gamma'_S / 283.15)^{0.5}$
- (17) $k_{i,v} = K_{s,v} * 1/\text{Conv02} * \mu_w / (\rho_w * g)$
- (18) $S_{ie} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$
- (19) $k_{rg} = (1 - S_{ie})^{0.5} * (1 - S_{ie}^{1/M_v})^{2M_v}$
- (20) $k_v = k_{i,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- (21) $C_{source} = H'_{TS} * C_R * \text{Conv01} * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * \text{Conv02}$
- (22) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

**TABLE 17
SOILGAS TO INDOOR AIR
VINING**

	Soil EPC C_R Units: $\mu\text{g}/\text{kg}$ Formula: Input	Soil Temp. T_S $^{\circ}\text{C}$ (10 for screening)	Soil Temp. T'_S K ($T_S + 273.15$)	Henry's Law Constant at ref. temp. H_R $\text{atm}\cdot\text{m}^3/\text{mol}$ lookup	Henry's Law Reference Temp. T_R K (lookup+273.15)	Normal Boiling Point T_B K lookup	Enthalpy of vaporization at T_S $\Delta H_{v,B}$ cal/mol lookup	Critical Temp. T_C K lookup	constant n unitless (Note 7)	Enthalpy of vaporization at T_S $\Delta H_{v,TS}$ cal/mol (Note 8)	Gas Constant R_c cal/mol-K	Henry's Law Constant at T_S H_{TS} $\text{atm}\cdot\text{m}^3/\text{mol}$ (Note 9)	Gas Constant R $\text{m}^3\cdot\text{atm}/\text{mol}\cdot\text{K}$	Henry's Law Constant H'_{TS} unitless $H_{TS} / (R * T'_S)$
Analyte														
Acetone	Not used	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	1.97E-05	8.21E-05	8.50E-04
Chloromethane	Not used	1.00E+01	2.83E+02	8.21E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	8.21E-03	8.21E-05	3.53E-01
Dichlorodifluoromethane	Not used	1.00E+01	2.83E+02	3.90E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	3.90E-01	8.21E-05	1.68E+01
Methylene Chloride	Not used	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	1.17E-03	8.21E-05	5.03E-02
n-Hexane	Not used	1.00E+01	2.83E+02	1.67E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.67E+00	8.21E-05	7.17E+01
Toluene	Not used	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	2.93E-03	8.21E-05	1.26E-01
Trichlorofluoromethane	Not used	1.00E+01	2.83E+02	1.00E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.00E-01	8.21E-05	4.30E+00

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

(1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor

TABLE 17 (continued)
SOILGAS TO INDOOR AIR
VINING

	Conversion Factor $\mu\text{g}/\text{kg}$ to g/g	SCS soil type in vadose zone	Vadose zone soil dry bulk density	Vadose zone soil water-filled porosity	Organic carbon partition coefficient	Vadose zone organic carbon fraction	Soil-water partition coefficient	Vadose zone soil total porosity	Vadose zone soil air-filled porosity	Conversion Factor g/cm^3 to $\mu\text{g}/\text{m}^3$	Source Vapor Conc.
	Conv01	ST_v	ρ_b	$\theta_{w,v}$	K_{oc}	$f_{oc,v}$	K_d	n_v	$\theta_{a,v}$	Conv03	C_{source}
	Units: $\mu\text{g}/\text{kg}$ / g/g	unitless	g/cm^3	cm^3/cm^3	cm^3/g	unitless	cm^3/g	cm^3/cm^3	cm^3/cm^3	g/cm^3 / $\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
	Formula:	(Note 11)	(1.5 for screening)	(0.3 for screening)	lookup	(0.002 for screening)	$K_{oc} * f_{oc}$	(0.43 for screening)	$n_v - \theta_{w,v}$		(Input)
Analyte					not used	not used	not used				
Acetone	1.00E-09	SCL	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	1.20E+01
Chloromethane	1.00E-09	SCL	1.50E+00	3.00E-01	7.72E+01	2.00E-03	1.54E-01	4.30E-01	1.30E-01	1.00E+12	1.30E+00
Dichlorodifluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.63E+02	2.00E-03	7.26E-01	4.30E-01	1.30E-01	1.00E+12	4.40E+00
Methylene Chloride	1.00E-09	SCL	1.50E+00	3.00E-01	1.17E+01	2.00E-03	2.34E-02	4.30E-01	1.30E-01	1.00E+12	2.00E+01
n-Hexane	1.00E-09	SCL	1.50E+00	3.00E-01	4.80E+02	2.00E-03	9.61E-01	4.30E-01	1.30E-01	1.00E+12	1.40E+01
Toluene	1.00E-09	SCL	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	2.30E+00
Trichlorofluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	1.58E+02	2.00E-03	3.17E-01	4.30E-01	1.30E-01	1.00E+12	4.30E+00

TABLE 17 (continued)
SOILGAS TO INDOOR AIR
VINING

	Depth below grade to bottom of enclosed space L_F	Depth below grade to contamination L_t	Source Building Separation L_T	Diffusivity in air D_a	Diffusivity in water D_w	Vadose zone Effective Diffusion Coeff. D_v^{eff}	Total Overall Effective Diffusion Coeff. D_T^{eff}	Area of Enclosed Space Below Grade A_B	Building Ventilation Rate $Q_{building}$	Pressure Diff. between soil & enclosed space ΔP	Vadose zone soil saturated hydraulic conductivity $K_{s,v}$
Units:	cm	cm	cm	cm ² /s	cm ² /s	cm ² /s	cm ² /s	cm ²	cm ³ /s	g/cm-s ²	cm/hr
Formula:	(15 or 200 for screening)	(400 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(56335 for screening)	(40 for screening)	lookup
Analyte											
Acetone	2.00E+02	4.00E+02	2.00E+02	1.24E-01	1.14E-05	2.07E-03	2.07E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Chloromethane	2.00E+02	4.00E+02	2.00E+02	1.26E-01	6.50E-06	7.65E-04	7.65E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Dichlorodifluoromethane	2.00E+02	4.00E+02	2.00E+02	6.65E-02	9.92E-06	4.03E-04	4.03E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Methylene Chloride	2.00E+02	4.00E+02	2.00E+02	1.01E-01	1.17E-05	6.35E-04	6.35E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
n-Hexane	2.00E+02	4.00E+02	2.00E+02	2.00E-01	7.77E-06	1.21E-03	1.21E-03	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Toluene	2.00E+02	4.00E+02	2.00E+02	8.70E-02	8.60E-06	5.34E-04	5.34E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01
Trichlorofluoromethane	2.00E+02	4.00E+02	2.00E+02	8.70E-02	9.70E-06	5.27E-04	5.27E-04	1.69E+06	5.63E+04	4.00E+01	5.50E-01

TABLE 17 (continued)
SOILGAS TO INDOOR AIR
VINING

	Conversion Factor hr to s Conv02 Units: Formula:	Viscosity of water at 10°C μ_{w-10} g/cm-s	Viscosity of water at system temp. μ_w g/cm-s (Note 16)	Density of water ρ_w g/cm ³ (0.999 for screening)	Acceleration due to gravity g cm/s ²	Vadose zone soil intrinsic permeability $k_{i,v}$ cm ² (Note 17)	Vadose zone residual soil water content $\theta_{r,v}$ cm ³ /cm ³ lookup	Vadose zone effective total fluid saturation S_{te} unitless (Note 18)	Vadose zone van Genuchten shape parameter M_v unitless lookup	Vadose zone soil relative air permeability k_{rg} unitless (Note 19)	Vadose zone soil effective vapor permeability k_v cm ² (Note 20)
Analyte											
Acetone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Dichlorodifluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Methylene Chloride	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Hexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Toluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Trichlorofluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09

TABLE 17 (continued)
SOILGAS TO INDOOR AIR
VINING

	Floor-wall seam perimeter X_{crack} Units: cm Formula: (3844 for screening)	Vapor viscosity at avg. soil temp. μ_{TS} g/cm-s $0.00018*(T_g/298.15)^{0.5}$	Crack depth below grade Z_{crack} cm (= L_F for screening)	Total area of cracks A_{crack} cm ² (384 for screening)	Crack-to-total area ratio η unitless A_{crack}/A_B	Equivalent crack radius r_{crack} cm $\eta(A_B/X_{crack})$	Avg. Vapor Flow Rate Into Bldg. Q_{soil} cm ³ /s (Note 5)	Foundation or Slab Thickness L_{crack} cm (15 for screening)	Crack Effective Diffusion Coeff. D^{crack} cm ² /s (Note 1)	Infinite Source Indoor Attenuation Coeff. α unitless (Note 6)	Infinite Source Bldg. Conc. $C_{building}$ µg/m ³ $C_{source} * \alpha$
Analyte											
Acetone	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	2.07E-03	1.25E-05	1.50E-04
Chloromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	7.65E-04	1.17E-05	1.52E-05
Dichlorodifluoromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	4.03E-04	1.07E-05	4.72E-05
Methylene Chloride	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	6.35E-04	1.15E-05	2.29E-04
n-Hexane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	1.21E-03	1.22E-05	1.70E-04
Toluene	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.34E-04	1.12E-05	2.58E-05
Trichlorofluoromethane	3.84E+03	1.75E-04	2.00E+02	3.84E+02	2.27E-04	9.99E-02	7.34E-01	1.50E+01	5.27E-04	1.12E-05	4.81E-05

TABLE 17 (continued)
SOILGAS TO INDOOR AIR
VINING

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- (1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- (2) For screening, $A_B = 923,521 \text{ cm}^2$ for $L_F = 15 \text{ cm}$ and $A_B = 1,692,321 \text{ cm}^2$ for $L_F = 200 \text{ cm}$
- (3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.
- (4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$
- (5) $Q_{soil} = (2 * \pi * \Delta P * k_v * X_{crack}) / (\mu_{TS} * \ln(2 * Z_{crack} / r_{crack}))$
- (6) $\alpha = [(D_T^{eff} * A_B / (Q_{building} * L_T)) * \text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack}))] / [\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) + (D_T^{eff} * A_B / (Q_{building} * L_T)) + (D_T^{eff} * A_B / (Q_{soil} * L_T)) * (\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) - 1)]$
- (7) A function of the ratio T_B/T_C :

T_B/T_C	α
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C) - 0.116$
>0.71	0.41
- (8) $\Delta H_{v,TS} = \Delta H_{v,B} * [(1 - T_S/T_C) / (1 - T_B/T_C)]^n$
- (9) $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_c * (1/T_S - 1/T_R)] * H_R$; or taken from lookup table.
- (10) Refer to 12 SCS soil types - use SC for screening.
- (11) Refer to 12 SCS soil types - use SCL for screening.
- (12) $L_{cz} = 0.15 / (0.2 * D_{cz})$
- (13) $D_v^{eff} = D_a * (\theta_{av}^{3.33} / n_v^2) + (D_w / H'_{TS}) * (\theta_{w,v}^{3.33} / n_v^2)$
- (14) $D_{cz}^{eff} = D_a * (\theta_{a,cz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS}) * (\theta_{w,cz}^{3.33} / n_{cz}^2)$
- (15) $\theta_{w,cz} = \theta_{rcz} + ((\theta_{scz} - \theta_{rcz}) / (2^{M_{cz}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- (16) $\mu_w = \mu_{w-10} * (T'_S / 283.15)^{0.5}$
- (17) $k_{i,v} = K_{s,v} * 1/\text{Conv}02 * \mu_w / (\rho_w * g)$
- (18) $S_{ie} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$
- (19) $k_{rg} = (1 - S_{ie})^{0.5} * (1 - S_{ie}^{1/M_v})^{2M_v}$
- (20) $k_v = k_{i,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- (21) $C_{source} = H'_{TS} * C_R * \text{Conv}01 * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * \text{Conv}02$

**TABLE 18
SOILGAS TO OUTDOOR AIR
VINING**

	Soil EPC	Soil Temp.	Soil Temp.	Henry's Law Constant at ref. temp.	Henry's Law Reference Temp.	Normal Boiling Point	Enthalpy of vaporization at T _S	Critical Temp.	constant	Enthalpy of vaporization at T _S	Gas Constant	Henry's Law Constant at T _S	Gas Constant	Henry's Law Constant
	C _R	T _S	T' _S	H _R	T _R	T _B	ΔH _{v,B}	T _C	n	ΔH _{v,T_S}	R _c	H _{T_S}	R	H' _{T_S}
Units:	μg/kg	°C	K	atm·m ³ /mol	K	K	cal/mol	K	unitless	cal/mol	cal/mol-K	atm·m ³ /mol	m ³ ·atm/mol-K	unitless
Formula:	Input	(10 for screening)	(T _S + 273.15)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)		(Note 9)		H _{T_S} / (R * T' _S)
Analyte														
Acetone	Not used	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	1.97E-05	8.21E-05	8.50E-04
Chloromethane	Not used	1.00E+01	2.83E+02	8.21E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	8.21E-03	8.21E-05	3.53E-01
Dichlorodifluoromethane	Not used	1.00E+01	2.83E+02	3.90E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	3.90E-01	8.21E-05	1.68E+01
Methylene Chloride	Not used	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	1.17E-03	8.21E-05	5.03E-02
n-Hexane	Not used	1.00E+01	2.83E+02	1.67E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.67E+00	8.21E-05	7.17E+01
Toluene	Not used	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	2.93E-03	8.21E-05	1.26E-01
Trichlorofluoromethane	Not used	1.00E+01	2.83E+02	1.00E-01	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.00E-01	8.21E-05	4.30E+00

TABLE 18 (continued)
SOILGAS TO OUTDOOR AIR
VINING

	Conversion Factor µg/kg to g/g	SCS soil type in vadose zone ST _v	Vadose zone soil dry bulk density ρ _b	Vadose zone soil water-filled porosity θ _{w,v}	Organic carbon partition coefficient K _{oc}	Vadose zone organic carbon fraction f _{oc,v}	Soil-water partition coefficient K _d	Vadose zone soil total porosity n _v	Vadose zone soil air-filled porosity θ _{a,v}	Conversion Factor g/cm ³ to µg/m ³	Source Vapor Conc. C _{source}
	Units: µg/kg / g/g	unitless	g/cm ³	cm ³ /cm ³	cm ³ /g	unitless	cm ³ /g	cm ³ /cm ³	cm ³ /cm ³	g/cm ³ / µg/m ³	µg/m ³
	Formula:	(Note 11)	(1.5 for screening)	(0.3 for screening)	lookup	(0.002 for screening)	K _{oc} * f _{oc}	(0.43 for screening)	n _v - θ _{w,v}	Conv03	(Input)
					not used	not used	not used				
Analyte											
Acetone	1.00E-09	SCL	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	1.20E+01
Chloromethane	1.00E-09	SCL	1.50E+00	3.00E-01	7.72E+01	2.00E-03	1.54E-01	4.30E-01	1.30E-01	1.00E+12	1.30E+00
Dichlorodifluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	3.63E+02	2.00E-03	7.26E-01	4.30E-01	1.30E-01	1.00E+12	4.40E+00
Methylene Chloride	1.00E-09	SCL	1.50E+00	3.00E-01	1.17E+01	2.00E-03	2.34E-02	4.30E-01	1.30E-01	1.00E+12	2.00E+01
n-Hexane	1.00E-09	SCL	1.50E+00	3.00E-01	4.80E+02	2.00E-03	9.61E-01	4.30E-01	1.30E-01	1.00E+12	1.40E+01
Toluene	1.00E-09	SCL	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	2.30E+00
Trichlorofluoromethane	1.00E-09	SCL	1.50E+00	3.00E-01	1.58E+02	2.00E-03	3.17E-01	4.30E-01	1.30E-01	1.00E+12	4.30E+00

TABLE 18 (continued)
SOILGAS TO OUTDOOR AIR
VINING

	Depth below grade to bottom of trench L_F	Depth below grade to contamination L_t	Source Trench Separation L_T	Diffusivity in air D_a	Diffusivity in water D_w	Vadose zone Effective Diffusion Coeff. D_v^{eff}	Total Overall Effective Diffusion Coeff. D_T^{eff}	Area of Trench Below Grade A_B	Trench Ventilation Rate Q_{trench}	Pressure Diff. between soil & enclosed space ΔP	Vadose zone soil saturated hydraulic conductivity $K_{s,v}$
Units:	cm	cm	cm	cm ² /s	cm ² /s	cm ² /s	cm ² /s	cm ²	cm ³ /s	g/cm-s ²	cm/hr
Formula:	(120 (4') for screening)	(400 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(Note 22)	(40 for screening)	lookup
Analyte											
Acetone	1.20E+02	4.00E+02	2.80E+02	1.24E-01	1.14E-05	2.07E-03	2.07E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Chloromethane	1.20E+02	4.00E+02	2.80E+02	1.26E-01	6.50E-06	7.65E-04	7.65E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Dichlorodifluoromethane	1.20E+02	4.00E+02	2.80E+02	6.65E-02	9.92E-06	4.03E-04	4.03E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Methylene Chloride	1.20E+02	4.00E+02	2.80E+02	1.01E-01	1.17E-05	6.35E-04	6.35E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
n-Hexane	1.20E+02	4.00E+02	2.80E+02	2.00E-01	7.77E-06	1.21E-03	1.21E-03	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Toluene	1.20E+02	4.00E+02	2.80E+02	8.70E-02	8.60E-06	5.34E-04	5.34E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01
Trichlorofluoromethane	1.20E+02	4.00E+02	2.80E+02	8.70E-02	9.70E-06	5.27E-04	5.27E-04	3.29E+05	1.70E+05	4.00E+01	5.50E-01

TABLE 18 (continued)
SOILGAS TO OUTDOOR AIR
VINING

	Conversion Factor hr to s Conv02 Units: Formula:	Viscosity of water at 10°C μ_{w-10} g/cm-s	Viscosity of water at system temp. μ_w g/cm-s (Note 16)	Density of water ρ_w g/cm ³ (0.999 for screening)	Acceleration due to gravity g cm/s ²	Vadose zone soil intrinsic permeability $k_{i,v}$ cm ² (Note 17)	Vadose zone residual soil water content $\theta_{r,v}$ cm ³ /cm ³ lookup	Vadose zone effective total fluid saturation S_{te} unitless (Note 18)	Vadose zone van Genuchten shape parameter M_v unitless lookup	Vadose zone soil relative air permeability k_{rg} unitless (Note 19)	Vadose zone soil effective vapor permeability k_v cm ² (Note 20)
Analyte											
Acetone	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Chloromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Dichlorodifluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Methylene Chloride	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
n-Hexane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Toluene	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09
Trichlorofluoromethane	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	2.04E-09	6.30E-02	6.46E-01	2.48E-01	5.42E-01	1.10E-09

TABLE 18 (continued)
SOILGAS TO OUTDOOR AIR
VINING

	Thickness of soil between soilgas & trench	Vapor viscosity at avg. soil temp.	Avg. Vapor Flow Rate Into trench	Infinite Source Attenuation Coeff.	Infinite Source Trench Conc.
	L_{soil}	μ_{TS}	Q_{soil}	α	C_{trench}
Units:	cm	g/cm-s	cm ³ /s	unitless	µg/m ³
Formula:	(1 for screening)	$0.00018*(T_s/298.15)^{0.5}$	(Note 5)	(Note 6)	$C_{source} * \alpha$
Analyte					
Acetone	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.78E-08
Chloromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	1.93E-09
Dichlorodifluoromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	6.52E-09
Methylene Chloride	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.96E-08
n-Hexane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	2.08E-08
Toluene	1.00E+00	1.75E-04	2.52E-04	1.48E-09	3.41E-09
Trichlorofluoromethane	1.00E+00	1.75E-04	2.52E-04	1.48E-09	6.37E-09

TABLE 18 (continued)
SOILGAS TO OUTDOOR AIR
VINING

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- (1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- (2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.
- (3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.
- (4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$
- (5) $Q_{soil} = (2 * \pi * \Delta P * k_v * X_{crack}) / (\mu_{TS} * \ln(2 * Z_{crack} / r_{crack}))$
- (6) $\alpha = [(D_T^{eff} * A_B / (Q_{building} * L_T)) * \text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack}))] / [\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) + (D_T^{eff} * A_B / (Q_{building} * L_T)) + (D_T^{eff} * A_B / (Q_{soil} * L_T)) * (\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) - 1)]$
- (7) A function of the ratio T_B/T_C :

T_B/T_C	α
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C) - 0.116$
>0.71	0.41
- (8) $\Delta H_{v,TS} = \Delta H_{v,B} * [(1 - T_S/T_C) / (1 - T_B/T_C)]^0.5$
- (9) $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_c * (1/T_S - 1/T_R)] * H_R$
- (10) Refer to 12 SCS soil types - use SC for screening.
- (11) Refer to 12 SCS soil types - use SCL for screening.
- (12) $L_{cz} = 0.15 / (0.2 * D_{cz})$
- (13) $D_v^{eff} = D_a * (\theta_{a,v}^{3.33} / n_v^2) + (D_w / H'_{TS}) * (\theta_{w,v}^{3.33} / n_v^2)$
- (14) $D_{cz}^{eff} = D_a * (\theta_{a,cz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS}) * (\theta_{w,cz}^{3.33} / n_{cz}^2)$
- (15) $\theta_{w,cz} = \theta_{r,cz} + ((\theta_{s,cz} - \theta_{r,cz}) / (2^{M_{cz}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- (16) $\mu_w = \mu_{w-10} * (T'_S / 283.15)^{0.5}$
- (17) $k_{i,v} = K_{s,v} * 1 / \text{Conv02} * \mu_w / (\rho_w * g)$
- (18) $S_{ie} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$
- (19) $k_{rg} = (1 - S_{ie})^{0.5} * (1 - S_{ie}^{1/M_v})^{2M_v}$
- (20) $k_v = k_{i,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- (21) $C_{source} = H'_{TS} * C_R * \text{Conv01} * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * \text{Conv02}$
- (22) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

CAR WASH WORKER

**TABLE 19. SHOWER MODEL
FOSTER AND CHROSTOWSKI**

Future Adult Scenario - Study Area Groundwater in Car Wash - Maximum Detected Concentrations¹

Analyte	Estimation of Gas-Phase Mass Transfer Coefficient (cm/hr)			Estimation of Liquid-Phase Mass Transfer Coefficient (cm/hour)			Estimation of Overall Mass Transfer Coefficient (cm/hr)			Temperature Adjusted Overall Mass Transfer Coefficient (cm/hr) -- K _L					Maximum Concentration Leaving the Shower Droplet				VOC Generation Rate in the Shower Room			VOC Air Concentration in the Shower Room (for t <= D _s)			
	k _{g(VOC)}			k _{l(VOC)}			K _L			K' _L					C _{w,d}				S			C _a (t)			
	k _{g(H2O)} cm/hr	MW g/mole	k _{g(VOC)} cm/hr	k _{l(CO2)} cm/hr	MW g/mole	k _{l(VOC)} cm/hr	H	RT	K _L	T ₁ K	T _s K	u ₁ cp	u _s cp	K' _L cm/hr	C _{w0} ug/L	t _d sec	d mm	C _{w,d} ug/L	FR l/min	SV m ³	S ug/m ³ -min	R min ⁻¹	D _s min	t min	C _a (t) mg/m ³
1,1,1-Trichloroethane	3.00E+03	1.33E+02	1.10E+03	2.00E+01	1.33E+02	1.15E+01	1.69E-02	2.40E-02	1.13E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.53E+01	3.40E+00	2.00E+00	1.00E+00	1.36E+00	1.00E+01	6.00E+00	2.26E+00	8.33E-03	1.50E+01	5.00E+00	1.11E-02
1,1,2-Trichloro-1,2,2-trifluoroethane	3.00E+03	1.87E+02	9.30E+02	2.00E+01	1.87E+02	9.69E+00	5.17E-01	2.40E-02	9.69E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.31E+01	3.60E+00	2.00E+00	1.00E+00	1.27E+00	1.00E+01	6.00E+00	2.12E+00	8.33E-03	1.50E+01	5.00E+00	1.04E-02
1,1-Dichloroethane	3.00E+03	9.90E+01	1.28E+03	2.00E+01	9.90E+01	1.33E+01	5.53E-03	2.40E-02	1.28E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.72E+01	9.90E+00	2.00E+00	1.00E+00	4.32E+00	1.00E+01	6.00E+00	7.20E+00	8.33E-03	1.50E+01	5.00E+00	3.53E-02
1,1-Dichloroethene	3.00E+03	9.69E+01	1.29E+03	2.00E+01	9.69E+01	1.35E+01	2.57E-02	2.40E-02	1.33E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.80E+01	8.40E+00	2.00E+00	1.00E+00	3.79E+00	1.00E+01	6.00E+00	6.31E+00	8.33E-03	1.50E+01	5.00E+00	3.09E-02
1,2,4-Trichlorobenzene	3.00E+03	1.81E+02	9.45E+02	2.00E+01	1.81E+02	9.85E+00	1.40E-03	2.40E-02	8.35E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.13E+01	2.50E-01	2.00E+00	1.00E+00	7.82E-02	1.00E+01	6.00E+00	1.30E-01	8.33E-03	1.50E+01	5.00E+00	6.39E-04
1,2-Dichlorobenzene	3.00E+03	1.47E+02	1.05E+03	2.00E+01	1.47E+02	1.09E+01	1.89E-03	2.40E-02	9.66E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.30E+01	1.10E+01	2.00E+00	1.00E+00	3.87E+00	1.00E+01	6.00E+00	6.46E+00	8.33E-03	1.50E+01	5.00E+00	3.16E-02
1,2-Dichloroethane	3.00E+03	9.90E+01	1.28E+03	2.00E+01	9.90E+01	1.33E+01	1.16E-03	2.40E-02	1.10E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.48E+01	4.80E+01	2.00E+00	1.00E+00	1.87E+01	1.00E+01	6.00E+00	3.11E+01	8.33E-03	1.50E+01	5.00E+00	1.52E-01
1,3-Dichlorobenzene	3.00E+03	1.47E+02	1.05E+03	2.00E+01	1.47E+02	1.09E+01	2.59E-03	2.40E-02	9.98E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.35E+01	1.25E+00	2.00E+00	1.00E+00	4.52E-01	1.00E+01	6.00E+00	7.53E-01	8.33E-03	1.50E+01	5.00E+00	3.69E-03
1,4-Dichlorobenzene	3.00E+03	1.47E+02	1.05E+03	2.00E+01	1.47E+02	1.09E+01	2.37E-03	2.40E-02	9.90E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.33E+01	6.00E+00	2.00E+00	1.00E+00	2.15E+00	1.00E+01	6.00E+00	3.59E+00	8.33E-03	1.50E+01	5.00E+00	1.76E-02
2-Butanone	3.00E+03	7.21E+01	1.50E+03	2.00E+01	7.21E+01	1.56E+01	5.60E-05	2.40E-02	2.86E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	3.85E+00	4.70E+02	2.00E+00	1.00E+00	5.66E+01	1.00E+01	6.00E+00	9.44E+01	8.33E-03	1.50E+01	5.00E+00	4.62E-01
4-Methyl-2-Pentanone	3.00E+03	1.00E+02	1.27E+03	2.00E+01	1.00E+02	1.33E+01	4.47E-04	2.40E-02	8.50E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.15E+01	1.20E+02	2.00E+00	1.00E+00	3.81E+01	1.00E+01	6.00E+00	6.35E+01	8.33E-03	1.50E+01	5.00E+00	3.11E-01
Acetone	3.00E+03	5.81E+01	1.67E+03	2.00E+01	5.81E+01	1.74E+01	3.89E-05	2.40E-02	2.34E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	3.16E+00	1.60E+04	2.00E+00	1.00E+00	1.60E+03	1.00E+01	6.00E+00	2.67E+03	8.33E-03	1.50E+01	5.00E+00	1.31E+01
Benzene	3.00E+03	7.81E+01	1.44E+03	2.00E+01	7.81E+01	1.50E+01	5.45E-03	2.40E-02	1.44E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.93E+01	6.90E+04	2.00E+00	1.00E+00	3.28E+04	1.00E+01	6.00E+00	5.47E+04	8.33E-03	1.50E+01	5.00E+00	2.68E+02
Carbon Disulfide	3.00E+03	7.61E+01	1.46E+03	2.00E+01	7.61E+01	1.52E+01	1.42E-02	2.40E-02	1.49E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	2.01E+01	9.00E+00	2.00E+00	1.00E+00	4.40E+00	1.00E+01	6.00E+00	7.33E+00	8.33E-03	1.50E+01	5.00E+00	3.59E-02
Chlorobenzene	3.00E+03	1.13E+02	1.20E+03	2.00E+01	1.13E+02	1.25E+01	3.05E-03	2.40E-02	1.16E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.56E+01	3.50E+01	2.00E+00	1.00E+00	1.42E+01	1.00E+01	6.00E+00	2.36E+01	8.33E-03	1.50E+01	5.00E+00	1.16E-01
Chloroethane	3.00E+03	6.45E+01	1.58E+03	2.00E+01	6.45E+01	1.65E+01	1.09E-02	2.40E-02	1.61E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	2.18E+01	3.70E+01	2.00E+00	1.00E+00	1.91E+01	1.00E+01	6.00E+00	3.18E+01	8.33E-03	1.50E+01	5.00E+00	1.56E-01
Chloroform	3.00E+03	1.19E+02	1.16E+03	2.00E+01	1.19E+02	1.21E+01	3.60E-03	2.40E-02	1.14E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.53E+01	4.00E+00	2.00E+00	1.00E+00	1.60E+00	1.00E+01	6.00E+00	2.66E+00	8.33E-03	1.50E+01	5.00E+00	1.30E-02
cis-1,2-Dichloroethene	3.00E+03	9.69E+01	1.29E+03	2.00E+01	9.69E+01	1.35E+01	4.01E-03	2.40E-02	1.27E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.71E+01	5.00E+01	2.00E+00	1.00E+00	2.17E+01	1.00E+01	6.00E+00	3.62E+01	8.33E-03	1.50E+01	5.00E+00	1.77E-01
Ethylbenzene	3.00E+03	1.06E+02	1.24E+03	2.00E+01	1.06E+02	1.29E+01	7.74E-03	2.40E-02	1.25E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.68E+01	1.70E+01	2.00E+00	1.00E+00	7.29E+00	1.00E+01	6.00E+00	1.22E+01	8.33E-03	1.50E+01	5.00E+00	5.95E-02
Isopropylbenzene	3.00E+03	1.20E+02	1.16E+03	2.00E+01	1.20E+02	1.21E+01	1.13E-02	2.40E-02	1.18E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.60E+01	8.90E-01	2.00E+00	1.00E+00	3.67E-01	1.00E+01	6.00E+00	6.12E-01	8.33E-03	1.50E+01	5.00E+00	3.00E-03
Methyl tert-Butyl Ether	3.00E+03	8.82E+01	1.36E+03	2.00E+01	8.82E+01	1.41E+01	5.77E-04	2.40E-02	9.85E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.33E+01	4.00E+03	2.00E+00	1.00E+00	1.43E+03	1.00E+01	6.00E+00	2.39E+03	8.33E-03	1.50E+01	5.00E+00	1.17E+01
Styrene	3.00E+03	1.04E+02	1.25E+03	2.00E+01	1.04E+02	1.30E+01	2.69E-03	2.40E-02	1.19E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.60E+01	1.70E-01	2.00E+00	1.00E+00	7.04E-02	1.00E+01	6.00E+00	1.17E-01	8.33E-03	1.50E+01	5.00E+00	5.74E-04
Tetrachloroethene	3.00E+03	1.66E+02	9.88E+02	2.00E+01	1.66E+02	1.03E+01	1.74E-02	2.40E-02	1.02E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.37E+01	2.00E+00	2.00E+00	1.00E+00	7.33E-01	1.00E+01	6.00E+00	1.22E+00	8.33E-03	1.50E+01	5.00E+00	5.98E-03
Toluene	3.00E+03	9.21E+01	1.38E+03	2.00E+01	9.21E+01	1.38E+01	6.51E-03	2.40E-02	1.33E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.79E+01	3.60E+03	2.00E+00	1.00E+00	1.62E+03	1.00E+01	6.00E+00	2.70E+03	8.33E-03	1.50E+01	5.00E+00	1.32E+01
trans-1,2-Dichloroethene	3.00E+03	9.69E+01	1.29E+03	2.00E+01	9.69E+01	1.35E+01	9.20E-03	2.40E-02	1.31E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.77E+01	2.10E+00	2.00E+00	1.00E+00	9.35E-01	1.00E+01	6.00E+00	1.56E+00	8.33E-03	1.50E+01	5.00E+00	7.63E-03
Trichloroethene	3.00E+03	1.31E+02	1.11E+03	2.00E+01	1.31E+02	1.16E+01	9.68E-03	2.40E-02	1.13E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.52E+01	1.10E+02	2.00E+00	1.00E+00	4.37E+01	1.00E+01	6.00E+00	7.29E+01	8.33E-03	1.50E+01	5.00E+00	3.57E-01
Vinyl Chloride	3.00E+03	6.25E+01	1.61E+03	2.00E+01	6.25E+01	1.68E+01	2.74E-02	2.40E-02	1.66E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	2.24E+01	1.25E+00	2.00E+00	1.00E+00	6.58E-01	1.00E+01	6.00E+00	1.10E+00	8.33E-03	1.50E+01	5.00E+00	5.37E-03
Xylene, total	3.00E+03	1.06E+02	1.24E+03	2.00E+01	1.06E+02	1.29E+01	6.51E-03	2.40E-02	1.24E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.67E+01	1.20E+02	2.00E+00	1.00E+00	5.13E+01	1.00E+01	6.00E+00	8.54E+01	8.33E-03	1.50E+01	5.00E+00	4.18E-01
2-Chloronaphthalene	3.00E+03	1.63E+02	9.98E+02	2.00E+01	1.63E+02	1.04E+01	3.07E-04	2.40E-02	5.73E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	7.73E+00	2.20E+01	2.00E+00	1.00E+00	5.00E+00	1.00E+01	6.00E+00	8.33E+00	8.33E-03	1.50E+01	5.00E+00	4.08E-02
2-Chlorophenol	3.00E+03	1.29E+02	1.12E+03	2.00E+01	1.29E+02	1.17E+01	8.17E-06	2.40E-02	3.70E-01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	4.99E-01	1.00E+00	2.00E+00	1.00E+00	1.65E-02	1.00E+01	6.00E+00	2.75E-02	8.33E-03	1.50E+01	5.00E+00	1.35E-04
Acenaphthene	3.00E+03	1.54E+02	1.02E+03	2.00E+01	1.54E+02	1.07E+01	1.79E-04	2.40E-02	4.45E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	6.00E+00	1.00E+00	2.00E+00	1.00E+00	1.81E-01	1.00E+01	6.00E+00	3.02E-01	8.33E-03	1.50E+01	5.00E+00	1.48E-03
Fluorene	3.00E+03	1.66E+02	9.87E+02	2.00E+01	1.66E+02																				

**TABLE 20. SHOWER MODEL
FOSTER AND CHROSTOWSKI**

Future Adult Scenario - Class A Properties Groundwater in Car Wash - Maximum Detected Concentrations¹

Analyte	Estimation of Gas-Phase Mass Transfer Coefficient (cm/hr) $k_{g(VOC)}$			Estimation of Liquid-Phase Mass Transfer Coefficient (cm/hr) $k_{l(VOC)}$			Estimation of Overall Mass Transfer Coefficient (cm/hr) K_L			Temperature Adjusted Overall Mass Transfer Coefficient (cm/hr) -- K'_L					Maximum Concentration Leaving the Shower Droplet C_{wd}				VOC Generation Rate in the Shower Room S			VOC Air Concentration in the Shower Room (for $t < D_s$) $C_a(t)$			
	$k_{g(VOC)} = k_{g(H_2O)} (18 / MW)^{0.5}$			$k_{l(VOC)} = k_{l(CO_2)} (44 / MW)^{0.5}$			$K_L = (1/k_{l(VOC)} + RT / H k_{g(VOC)})^{-1}$			$K'_L = K_L (T_1 u_s / T_s u_i)^{-0.5}$					$C_{wd} = C_{wo} (1 - \exp[-K_{al} t / 60 d])$				$S = C_{wd} (FR) / SV$			$C_a(t) = (S/R) (1 - \exp[-R t])$			
	$k_{g(H_2O)}$ cm/hr	MW g/mole	$k_{g(VOC)}$ cm/hr	$k_{l(CO_2)}$ cm/hr	MW g/mole	$k_{l(VOC)}$ cm/hr	H atm-m ³ /mole	RT atm-m ³ /mole	K_L cm/hr	T_1 K	T_s K	u_i cp	u_s cp	K'_L cm/hr	C_{wo} ug/L	t_s sec	d mm	C_{wd} ug/L	FR l/min	SV m ³	S ug/m ³ -min	R min ⁻¹	D_s min	t min	$C_a(t)$ mg/m ³
Ethylbenzene	3.00E+03	1.06E+02	1.24E+03	2.00E+01	1.06E+02	1.29E+01	7.74E-03	2.40E-02	1.25E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.68E+01	4.90E-01	2.00E+00	1.00E+00	2.10E-01	1.00E+01	6.00E+00	3.50E-01	8.33E-03	1.50E+01	5.00E+00	1.72E-03
Methyl tert-Butyl Ether	3.00E+03	8.82E+01	1.36E+03	2.00E+01	8.82E+01	1.41E+01	5.77E-04	2.40E-02	9.85E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.33E+01	1.70E+00	2.00E+00	1.00E+00	6.08E-01	1.00E+01	6.00E+00	1.01E+00	8.33E-03	1.50E+01	5.00E+00	4.96E-03
Toluene	3.00E+03	9.21E+01	1.33E+03	2.00E+01	9.21E+01	1.38E+01	6.51E-03	2.40E-02	1.33E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.79E+01	1.60E+00	2.00E+00	1.00E+00	7.20E-01	1.00E+01	6.00E+00	1.20E+00	8.33E-03	1.50E+01	5.00E+00	5.88E-03
Xylene, total	3.00E+03	1.06E+02	1.24E+03	2.00E+01	1.06E+02	1.29E+01	6.51E-03	2.40E-02	1.24E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.67E+01	3.30E+00	2.00E+00	1.00E+00	1.41E+00	1.00E+01	6.00E+00	2.35E+00	8.33E-03	1.50E+01	5.00E+00	1.15E-02

Notes:

¹ See Table 2 in Appendix 6D for analytes retained for analysis.

MW = Molecular weight (g/mole)

$k_{g(H_2O)}$ = Gas phase mass transfer coefficient for H₂O (cm/hr)

$k_{g(VOC)}$ = Gas-phase mass-transfer coefficient for the analyte (cm/hr)

$k_{l(CO_2)}$ = Liquid phase mass transfer coefficient for CO₂ (cm/hr)

$k_{l(VOC)}$ = Liquid-phase mass-transfer coefficient for the analyte (cm/hr)

H = Henry's Law Constant (atm-m³/mole)

RT = Gas constant-temp factor (atm-m³/mole)

K_L = Overall Mass-Transfer Coefficient (cm/hr)

T_1 = Calibration water temperature of K_L (K)

T_s = Shower water temperature (range 300-320 K)

u_i = Water viscosity at T_1 (at 20 C), centipoise (cp)

u_s = Water viscosity at T_s (at 45 C), centipoise (cp)

K'_L = Temp adjusted mass-transfer coefficient (cm/hr)

C_{wo} = Shower water concentration (tap water conc. - ug/L)

t_s = Shower droplet drop time (sec)

d = Shower droplet diameter (millimeters, mm)

C_{wd} = Concentration leaving shower droplet after time t_s (ug/L)

FR = Shower water flow rate (liters/minute, l/m)

SV = Shower room air volume (m³)

S = VOC generation rate in the shower room (ug/m³-min)

R = Air exchange rate (min⁻¹)

D_s = Shower duration (min)

t = time (min)

$C_a(t)$ = Time dependent indoor concentration

TABLE 21.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air

Exposure Point (1)	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution) (2)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (3)	Rationale (4)
Study Area	1,1-Dichloroethene	ug/L	6.3E-01	9.5E-01 (NP)	8.4E+00	9.5E-01	ug/L	95% UCL - NP	(f)
	1,2,4-Trichlorobenzene	ug/L	3.3E-01	4.5E-01 (NP)	2.5E-01 J	2.5E-01	ug/L	Max	(g)
	1,2-Dichlorobenzene	ug/L	6.8E-01	1.2E+00 (NP)	1.1E+01	1.2E+00	ug/L	95% UCL - NP	(f)
	1,2-Dichloroethane	ug/L	7.7E-01	2.1E+00 (NP)	4.8E+01	2.1E+00	ug/L	95% UCL - NP	(f)
	1,4-Dichlorobenzene	ug/L	5.7E-01	8.5E-01 (NP)	6.0E+00 J	8.5E-01	ug/L	95% UCL - NP	(f)
	4-Methyl-2-Pentanone	ug/L	4.6E+00	9.6E+00 (NP)	1.2E+02	9.6E+00	ug/L	95% UCL - NP	(f)
	Acetone	ug/L	1.5E+02	8.2E+02 (NP)	1.6E+04	8.2E+02	ug/L	95% UCL - NP	(f)
	Benzene	ug/L	5.8E+02	2.4E+03 (NP)	6.9E+04	2.4E+03	ug/L	95% UCL - NP	(f)
	Chlorobenzene	ug/L	1.4E+00	2.8E+00 (NP)	3.5E+01	2.8E+00	ug/L	95% UCL - NP	(f)
	Chloroethane	ug/L	1.0E+00	2.1E+00 (NP)	3.7E+01 J	2.1E+00	ug/L	95% UCL - NP	(f)
	Chloroform	ug/L	5.2E-01	7.4E-01 (NP)	4.0E+00 J	7.4E-01	ug/L	95% UCL - NP	(f)
	cis-1,2-Dichloroethene	ug/L	1.1E+00	2.6E+00 (NP)	5.0E+01	2.6E+00	ug/L	95% UCL - NP	(f)
	Methyl tert-Butyl Ether	ug/L	5.8E+01	4.1E+02 (NP)	4.0E+03 J	4.1E+02	ug/L	95% UCL - NP	(f)
	Tetrachloroethene	ug/L	4.9E-01	6.7E-01 (NP)	2.0E+00 J	6.7E-01	ug/L	95% UCL - NP	(f)
	Toluene	ug/L	7.0E+01	2.4E+02 (NP)	3.6E+03	2.4E+02	ug/L	95% UCL - NP	(f)
	trans-1,2-Dichloroethene	ug/L	4.8E-01	6.6E-01 (NP)	2.1E+00	6.6E-01	ug/L	95% UCL - NP	(f)
	Trichloroethene	ug/L	3.2E+00	9.5E+00 (NP)	1.1E+02 J	9.5E+00	ug/L	95% UCL - NP	(f)
	Vinyl Chloride	ug/L	4.8E-01	6.5E-01 (NP)	1.3E+00 J	6.5E-01	ug/L	95% UCL - NP	(f)
	Xylene, total	ug/L	2.9E+00	9.0E+00 (NP)	1.2E+02	9.0E+00	ug/L	95% UCL - NP	(f)
	2-Chloronaphthalene	ug/L	8.7E-01	2.3E+00 (NP)	2.2E+01	2.3E+00	ug/L	95% UCL - NP	(f)
	Naphthalene	ug/L	6.7E+00	2.8E+01 (NP)	2.2E+02	2.8E+01	ug/L	95% UCL - NP	(f)

TABLE 21.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air

Exposure Point (1)	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution) (2)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (3)	Rationale (4)
Class A	Methyl tert-Butyl Ether	ug/L	3.6E-01	7.3E-01 (NP)	1.7E+00	7.3E-01	ug/L	95% UCL - NP	(f)
	Xylene, total	ug/L	9.0E-01	1.9E+00 (NP)	3.3E+00	1.9E+00	ug/L	95% UCL - NP	(f)

(1) Refer to Appendix 6B, Table 5 for sample groupings for each exposure point; only COPCs selected on Table 2.11 appear.

(2) T - Transformed; N - Normal; NP - Non-parametric; G - Gamma; <4 - sample size too small to calculate 95% UCL

(3) Statistics: Maximum Detected Value (Max); 95% UCL of Transformed Data (95% UCL - T); 95% UCL of Normal Data (95% UCL - N); 95% UCL of Non-parametric Data (95% UCL - NP); 95% UCL of Gamma Distributed Data (95% UCL - G); Arithmetic Mean (Mean)

(4) Rationale:

- (a) Due to small sample size (<4), the maximum detected concentration is used.
- (b) When the maximum detected concentration is selected as the RME EPC, the arithmetic mean concentration is selected as the CT EPC.
- (c) If the arithmetic mean concentration equals or exceeds the maximum detected concentration, the maximum detected concentration is used as the CT EPC.
- (d) Shapiro-Wilk W Test or Lilliefors Test indicates data are normally distributed.
- (e) Shapiro-Wilk W Test or Lilliefors Test indicates data are log-normally distributed.
- (f) Shapiro-Wilk W Test or Lilliefors Test indicates data are neither normally nor log-normally distributed.
- (g) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC
- (h) A-D Test and/or K-S Test indicates data are gamma distributed.

J = Estimated Concentration
Max = Maximum Detected Concentration
N/A = Not Applicable
UCL = Upper Confidence Limit
EPC = Exposure Point Concentration
RME = Reasonable Maximum Exposure
CT = Central Tendency

TABLE 21.CT
EXPOSURE POINT CONCENTRATION SUMMARY
CENTRAL TENDENCY EXPOSURE
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air

Exposure Point (1)	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution) (2)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (3)	Rationale (4)
Study Area	1,1-Dichloroethene	ug/L	6.3E-01	9.5E-01 (NP)	8.4E+00	9.5E-01	ug/L	95% UCL - NP	(f)
	1,2,4-Trichlorobenzene	ug/L	3.3E-01	4.5E-01 (NP)	2.5E-01 J	2.5E-01	ug/L	Max	(c)
	1,2-Dichlorobenzene	ug/L	6.8E-01	1.2E+00 (NP)	1.1E+01	1.2E+00	ug/L	95% UCL - NP	(f)
	1,2-Dichloroethane	ug/L	7.7E-01	2.1E+00 (NP)	4.8E+01	2.1E+00	ug/L	95% UCL - NP	(f)
	1,4-Dichlorobenzene	ug/L	5.7E-01	8.5E-01 (NP)	6.0E+00 J	8.5E-01	ug/L	95% UCL - NP	(f)
	4-Methyl-2-Pentanone	ug/L	4.6E+00	9.6E+00 (NP)	1.2E+02	9.6E+00	ug/L	95% UCL - NP	(f)
	Acetone	ug/L	1.5E+02	8.2E+02 (NP)	1.6E+04	8.2E+02	ug/L	95% UCL - NP	(f)
	Benzene	ug/L	5.8E+02	2.4E+03 (NP)	6.9E+04	2.4E+03	ug/L	95% UCL - NP	(f)
	Chlorobenzene	ug/L	1.4E+00	2.8E+00 (NP)	3.5E+01	2.8E+00	ug/L	95% UCL - NP	(f)
	Chloroethane	ug/L	1.0E+00	2.1E+00 (NP)	3.7E+01 J	2.1E+00	ug/L	95% UCL - NP	(f)
	Chloroform	ug/L	5.2E-01	7.4E-01 (NP)	4.0E+00 J	7.4E-01	ug/L	95% UCL - NP	(f)
	cis-1,2-Dichloroethene	ug/L	1.1E+00	2.6E+00 (NP)	5.0E+01	2.6E+00	ug/L	95% UCL - NP	(f)
	Methyl tert-Butyl Ether	ug/L	5.8E+01	4.1E+02 (NP)	4.0E+03 J	4.1E+02	ug/L	95% UCL - NP	(f)
	Tetrachloroethene	ug/L	4.9E-01	6.7E-01 (NP)	2.0E+00 J	6.7E-01	ug/L	95% UCL - NP	(f)
	Toluene	ug/L	7.0E+01	2.4E+02 (NP)	3.6E+03	2.4E+02	ug/L	95% UCL - NP	(f)
	trans-1,2-Dichloroethene	ug/L	4.8E-01	6.6E-01 (NP)	2.1E+00	6.6E-01	ug/L	95% UCL - NP	(f)
	Trichloroethene	ug/L	3.2E+00	9.5E+00 (NP)	1.1E+02 J	9.5E+00	ug/L	95% UCL - NP	(f)
	Vinyl Chloride	ug/L	4.8E-01	6.5E-01 (NP)	1.3E+00 J	6.5E-01	ug/L	95% UCL - NP	(f)
	Xylene, total	ug/L	2.9E+00	9.0E+00 (NP)	1.2E+02	9.0E+00	ug/L	95% UCL - NP	(f)
	2-Chloronaphthalene	ug/L	8.7E-01	2.3E+00 (NP)	2.2E+01	2.3E+00	ug/L	95% UCL - NP	(f)
	Naphthalene	ug/L	6.7E+00	2.8E+01 (NP)	2.2E+02	2.8E+01	ug/L	95% UCL - NP	(f)

TABLE 21.CT
EXPOSURE POINT CONCENTRATION SUMMARY
CENTRAL TENDENCY EXPOSURE
INDUSTRI-PLEX SUPERFUND SITE

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air

Exposure Point (1)	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution) (2)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (3)	Rationale (4)
Class A	Methyl tert-Butyl Ether	ug/L	3.6E-01	7.3E-01 (NP)	1.7E+00	7.3E-01	ug/L	95% UCL - NP	(f)
	Xylene, total	ug/L	9.0E-01	1.9E+00 (NP)	3.3E+00	1.9E+00	ug/L	95% UCL - NP	(f)

(1) Refer to Appendix 6B, Table 5 for sample groupings for each exposure point; only COPCs selected on Table 2.11 appear.

(2) T - Transformed; N - Normal; NP - Non-parametric; G - Gamma; <4 - sample size too small to calculate 95% UCL

(3) Statistics: Maximum Detected Value (Max); 95% UCL of Transformed Data (95% UCL - T); 95% UCL of Normal Data (95% UCL - N); 95% UCL of Non-parametric Data (95% UCL - NP); 95% UCL of Gamma Distributed Data (95% UCL - G); Arithmetic Mean (Mean)

(4) Rationale:

- (a) Due to small sample size (<4), the maximum detected concentration is used.
- (b) When the maximum detected concentration is selected as the RME EPC, the arithmetic mean concentration is selected as the CT EPC.
- (c) If the arithmetic mean concentration equals or exceeds the maximum detected concentration, the maximum detected concentration is used as the CT EPC.
- (d) Shapiro-Wilk W Test or Lilliefors Test indicates data are normally distributed.
- (e) Shapiro-Wilk W Test or Lilliefors Test indicates data are log-normally distributed.
- (f) Shapiro-Wilk W Test or Lilliefors Test indicates data are neither normally nor log-normally distributed.
- (g) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC
- (h) A-D Test and/or K-S Test indicates data are gamma distributed.

J = Estimated Concentration
Max = Maximum Detected Concentration
N/A = Not Applicable
UCL = Upper Confidence Limit
EPC = Exposure Point Concentration
RME = Reasonable Maximum Exposure
CT = Central Tendency

**TABLE 22. SHOWER MODEL
FOSTER AND CHROSTOWSKI**

Future Adult Scenario - Study Area Groundwater in Car Wash - 95% UCL Concentrations¹

Analyte	Estimation of Gas-Phase Mass Transfer Coefficient (cm/hr)			Estimation of Liquid-Phase Mass Transfer Coefficient (cm/hr)			Estimation of Overall Mass Transfer Coefficient (cm/hr)			Temperature Adjusted Overall Mass Transfer Coefficient (cm/hr) -- K _L					Maximum Concentration Leaving the Shower Droplet				VOC Generation Rate in the Shower Room			VOC Air Concentration in the Shower Room (for t <= D _s)			
	k _{g(VOC)}			k _{l(VOC)}			K _L			K' _L					C _{wd}				S			C _{a(t)}			
	k _{g(H2O)} cm/hr	MW g/mole	k _{g(VOC)} cm/hr	k _{l(CO2)} cm/hr	MW g/mole	k _{l(VOC)} cm/hr	H atm-m ³ /mole	RT atm-m ³ /mole	K _L cm/hr	T ₁ K	T _s K	u ₁ cp	u _s cp	K' _L cm/hr	C _{wo} ug/L	t _s sec	d mm	C _{wd} ug/L	FR l/min	SV m ³	S ug/m ³ -min	R min ⁻¹	D _s min	t min	C _{a(t)} mg/m ³
1,1-Dichloroethene	3.00E+03	9.69E+01	1.29E+03	2.00E+01	9.69E+01	1.35E+01	2.57E-02	2.40E-02	1.33E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.80E+01	9.50E-01	2.00E+00	1.00E+00	4.28E-01	1.00E+01	6.00E+00	7.14E-01	8.33E-03	1.50E+01	5.00E+00	3.50E-03
1,2,4-Trichlorobenzene	3.00E+03	1.81E+02	9.45E+02	2.00E+01	1.81E+02	9.85E+00	1.40E-03	2.40E-02	8.35E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.13E+01	2.50E-01	2.00E+00	1.00E+00	7.82E-02	1.00E+01	6.00E+00	1.30E-01	8.33E-03	1.50E+01	5.00E+00	6.39E-04
1,2-Dichlorobenzene	3.00E+03	1.47E+02	1.05E+03	2.00E+01	1.47E+02	1.09E+01	1.89E-03	2.40E-02	9.66E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.30E+01	1.15E+00	2.00E+00	1.00E+00	4.06E-01	1.00E+01	6.00E+00	6.77E-01	8.33E-03	1.50E+01	5.00E+00	3.32E-03
1,2-Dichloroethane	3.00E+03	9.90E+01	1.28E+03	2.00E+01	9.90E+01	1.33E+01	1.16E-03	2.40E-02	1.10E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.48E+01	2.13E+00	2.00E+00	1.00E+00	8.29E-01	1.00E+01	6.00E+00	1.38E+00	8.33E-03	1.50E+01	5.00E+00	6.77E-03
1,4-Dichlorobenzene	3.00E+03	1.47E+02	1.05E+03	2.00E+01	1.47E+02	1.09E+01	2.37E-03	2.40E-02	9.90E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.33E+01	8.50E-01	2.00E+00	1.00E+00	3.05E-01	1.00E+01	6.00E+00	5.09E-01	8.33E-03	1.50E+01	5.00E+00	2.49E-03
4-Methyl-2-Pentanone	3.00E+03	1.00E+02	1.27E+03	2.00E+01	1.00E+02	1.33E+01	4.47E-04	2.40E-02	8.50E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.15E+01	9.63E+00	2.00E+00	1.00E+00	3.05E+00	1.00E+01	6.00E+00	5.09E+00	8.33E-03	1.50E+01	5.00E+00	2.49E-02
Acetone	3.00E+03	5.81E+01	1.67E+03	2.00E+01	5.81E+01	1.74E+01	3.89E-05	2.40E-02	2.34E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	3.16E+00	8.16E+02	2.00E+00	1.00E+00	8.16E+01	1.00E+01	6.00E+00	1.36E+02	8.33E-03	1.50E+01	5.00E+00	6.66E-01
Benzene	3.00E+03	7.81E+01	1.44E+03	2.00E+01	7.81E+01	1.50E+01	5.45E-03	2.40E-02	1.44E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.93E+01	2.39E+03	2.00E+00	1.00E+00	1.14E+03	1.00E+01	6.00E+00	1.89E+03	8.33E-03	1.50E+01	5.00E+00	9.27E+00
Chlorobenzene	3.00E+03	1.13E+02	1.20E+03	2.00E+01	1.13E+02	1.25E+01	3.05E-03	2.40E-02	1.16E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.56E+01	2.80E+00	2.00E+00	1.00E+00	1.14E+00	1.00E+01	6.00E+00	1.89E+00	8.33E-03	1.50E+01	5.00E+00	9.27E-03
Chloroethane	3.00E+03	6.45E+01	1.58E+03	2.00E+01	6.45E+01	1.65E+01	1.09E-02	2.40E-02	1.61E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	2.18E+01	2.09E+00	2.00E+00	1.00E+00	1.08E+00	1.00E+01	6.00E+00	1.80E+00	8.33E-03	1.50E+01	5.00E+00	8.81E-03
Chloroform	3.00E+03	1.19E+02	1.16E+03	2.00E+01	1.19E+02	1.21E+01	3.60E-03	2.40E-02	1.14E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.53E+01	7.45E-01	2.00E+00	1.00E+00	2.98E-01	1.00E+01	6.00E+00	4.96E-01	8.33E-03	1.50E+01	5.00E+00	2.43E-03
cis-1,2-Dichloroethene	3.00E+03	9.69E+01	1.29E+03	2.00E+01	9.69E+01	1.35E+01	4.01E-03	2.40E-02	1.27E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.71E+01	2.65E+00	2.00E+00	1.00E+00	1.15E+00	1.00E+01	6.00E+00	1.92E+00	8.33E-03	1.50E+01	5.00E+00	9.39E-03
Methyl tert-Butyl Ether	3.00E+03	8.82E+01	1.36E+03	2.00E+01	8.82E+01	1.41E+01	5.77E-04	2.40E-02	9.85E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.33E+01	4.15E+02	2.00E+00	1.00E+00	1.48E+02	1.00E+01	6.00E+00	2.47E+02	8.33E-03	1.50E+01	5.00E+00	1.21E+00
Tetrachloroethene	3.00E+03	1.66E+02	9.88E+02	2.00E+01	1.66E+02	1.03E+01	1.74E-02	2.40E-02	1.02E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.37E+01	6.65E-01	2.00E+00	1.00E+00	2.44E-01	1.00E+01	6.00E+00	4.06E-01	8.33E-03	1.50E+01	5.00E+00	1.99E-03
Toluene	3.00E+03	9.21E+01	1.33E+03	2.00E+01	9.21E+01	1.38E+01	6.51E-03	2.40E-02	1.33E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.79E+01	2.39E+02	2.00E+00	1.00E+00	1.08E+02	1.00E+01	6.00E+00	1.80E+02	8.33E-03	1.50E+01	5.00E+00	8.79E-01
trans-1,2-Dichloroethene	3.00E+03	9.69E+01	1.29E+03	2.00E+01	9.69E+01	1.35E+01	9.20E-03	2.40E-02	1.31E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.77E+01	6.59E-01	2.00E+00	1.00E+00	2.93E-01	1.00E+01	6.00E+00	4.89E-01	8.33E-03	1.50E+01	5.00E+00	2.39E-03
Trichloroethene	3.00E+03	1.31E+02	1.11E+03	2.00E+01	1.31E+02	1.16E+01	9.68E-03	2.40E-02	1.13E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.52E+01	9.47E+00	2.00E+00	1.00E+00	3.77E+00	1.00E+01	6.00E+00	6.28E+00	8.33E-03	1.50E+01	5.00E+00	3.07E-02
Vinyl Chloride	3.00E+03	6.25E+01	1.61E+03	2.00E+01	6.25E+01	1.68E+01	2.74E-02	2.40E-02	1.66E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	2.24E+01	6.54E-01	2.00E+00	1.00E+00	3.44E-01	1.00E+01	6.00E+00	5.73E-01	8.33E-03	1.50E+01	5.00E+00	2.81E-03
Xylene, total	3.00E+03	1.06E+02	1.24E+03	2.00E+01	1.06E+02	1.29E+01	6.51E-03	2.40E-02	1.24E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.67E+01	8.96E+00	2.00E+00	1.00E+00	3.83E+00	1.00E+01	6.00E+00	6.38E+00	8.33E-03	1.50E+01	5.00E+00	3.13E-02
2-Chloronaphthalene	3.00E+03	1.63E+02	9.98E+02	2.00E+01	1.63E+02	1.04E+01	3.07E-04	2.40E-02	5.73E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	7.73E+00	2.26E+00	2.00E+00	1.00E+00	5.13E-01	1.00E+01	6.00E+00	8.55E-01	8.33E-03	1.50E+01	5.00E+00	4.19E-03
Naphthalene	3.00E+03	1.28E+02	1.12E+03	2.00E+01	1.28E+02	1.17E+01	4.32E-04	2.40E-02	7.42E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.00E+01	2.84E+01	2.00E+00	1.00E+00	8.05E+00	1.00E+01	6.00E+00	1.34E+01	8.33E-03	1.50E+01	5.00E+00	6.57E-02

Notes:

¹ See Table 21 in Appendix 6D for analytes retained following screening. Note that 1,2,4-trichlorobenzene is maximum concentration rather than 95% UCL.

- MW = Molecular weight (g/mole)
- k_{g(H2O)} = Gas phase mass transfer coefficient for H₂O (cm/hr)
- k_{g(VOC)} = Gas-phase mass-transfer coefficient for the analyte (cm/hr)
- k_{l(CO2)} = Liquid phase mass transfer coefficient for CO₂ (cm/hr)
- k_{l(VOC)} = Liquid-phase mass-transfer coefficient for the analyte (cm/hr)
- H = Henry's Law Constant (atm-m³/mole)
- RT = Gas constant-temp factor (atm-m³/mole)
- K_L = Overall Mass-Transfer Coefficient (cm/hr)
- T₁ = Calibration water temperature of K_L (K)
- T_s = Shower water temperature (range 300-320 K)
- u₁ = Water viscosity at T₁ (at 20 C), centipoise (cp)
- u_s = Water viscosity at T_s (at 45 C), centipoise (cp)
- K'_L = Temp adjusted mass-transfer coefficient (cm/hr)
- C_{wo} = Shower water concentration (tap water conc. - ug/L)
- t_s = Shower droplet drop time (sec)
- d = Shower droplet diameter (millimeters, mm)
- C_{wd} = Concentration leaving shower droplet after time t_s (ug/L)
- FR = Shower water flow rate (liters/minute, l/m)
- SV = Shower room air volume (m³)
- S = VOC generation rate in the shower room (ug/m³-min)
- R = Air exchange rate (min-1)
- D_s = Shower duration (min)
- t = time (min)
- C_{a(t)} = Time dependent indoor concentration

TABLE 23. SHOWER MODEL
FOSTER AND CHROSTOWSKI

Future Adult Scenario - Class A Properties Groundwater in Car Wash - 95% UCL Concentrations¹

Analyte	Estimation of Gas-Phase Mass Transfer Coefficient (cm/hr) $k_{g(VOC)}$			Estimation of Liquid-Phase Mass Transfer Coefficient (cm/hour) $k_{l(VOC)}$			Estimation of Overall Mass Transfer Coefficient (cm/hr) K_L			Temperature Adjusted Overall Mass Transfer Coefficient (cm/hr) -- K'_L					Maximum Concentration Leaving the Shower Droplet C_{wd}				VOC Generation Rate in the Shower Room S			VOC Air Concentration in the Shower Room (for $t <= D_s$) $C_a(t)$			
	$k_{g(H2O)}$ cm/hr	MW g/mole	$k_{g(VOC)}$ cm/hr	$k_{l(CO2)}$ cm/hr	MW g/mole	$k_{l(VOC)}$ cm/hr	H atm-m ³ /mole	RT atm-m ³ /mole	K_L cm/hr	T_1 K	T_s K	u_1 cp	u_4 cp	K'_L cm/hr	C_{wo} ug/L	t_d sec	d mm	C_{wd} ug/L	FR l/min	SV m ³	S ug/m ³ -min	R min ⁻¹	D_s min	t min	$C_a(t)$ mg/m ³
Methyl tert-Butyl Ether	3.00E+03	8.82E+01	1.36E+03	2.00E+01	8.82E+01	1.41E+01	5.77E-04	2.40E-02	9.85E+00	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.33E+01	7.31E-01	2.00E+00	1.00E+00	2.62E-01	1.00E+01	6.00E+00	4.36E-01	8.33E-03	1.50E+01	5.00E+00	2.13E-03
Xylene, total	3.00E+03	1.06E+02	1.24E+03	2.00E+01	1.06E+02	1.29E+01	6.51E-03	2.40E-02	1.24E+01	2.93E+02	3.18E+02	1.00E+00	5.96E-01	1.67E+01	1.89E+00	2.00E+00	1.00E+00	8.06E-01	1.00E+01	6.00E+00	1.34E+00	8.33E-03	1.50E+01	5.00E+00	6.58E-03

Notes:

¹ See Table 21 in Appendix 6D for analytes retained following screening.

- MW = Molecular weight (g/mole)
- $k_{g(H2O)}$ = Gas phase mass transfer coefficient for H₂O (cm/hr)
- $k_{g(VOC)}$ = Gas-phase mass-transfer coefficient for the analyte (cm/hr)
- $k_{l(CO2)}$ = Liquid phase mass transfer coefficient for CO₂ (cm/hr)
- $k_{l(VOC)}$ = Liquid-phase mass-transfer coefficient for the analyte (cm/hr)
- H = Henry's Law Constant (atm-m³/mole)
- RT = Gas constant-temp factor (atm-m³/mole)
- K_L = Overall Mass-Transfer Coefficient (cm/hr)
- T_1 = Calibration water temperature of K_L (K)
- T_s = Shower water temperature (range 300-320 K)
- u_1 = Water viscosity at T_1 (at 20 C), centipoise (cp)
- u_4 = Water viscosity at T_4 (at 45 C), centipoise (cp)
- K'_L = Temp adjusted mass-transfer coefficient (cm/hr)
- C_{wo} = Shower water concentration (tap water conc. - ug/L)
- t_d = Shower droplet drop time (sec)
- d = Shower droplet diameter (millimeters, mm)
- C_{wd} = Concentration leaving shower droplet after time t_d (ug/L)
- FR = Shower water flow rate (liters/minute, l/m)
- SV = Shower room air volume (m³)
- S = VOC generation rate in the shower room (ug/m³-min)
- R = Air exchange rate (min-1)
- D_s = Shower duration (min)
- t = time (min)
- $C_a(t)$ = Time dependent indoor concentration

APPENDIX 6E

DATA TREATMENT

Data Treatment

This attachment discussed the use and treatment of the analytical data prior to use in the baseline human health risk assessment.

The following criteria were applied to the analytical data:

- If a value is not flagged, the value was used as reported (a detected value);
- If a value is flagged with "J", the value was used as reported (a detected value);
- If a value is flagged with "R" or "UR", the value was considered not to exist and was not used (a rejected value); and
- If the value is flagged with "U" or "UJ", the result was considered a nondetected (an undetected) value.

Prior to using analytical data for a primary sample with an associated field duplicate, the analytical values for the primary sample and the field duplicate were averaged together to provide a single set of values for the field duplicate pair. The following conventions were used for averaging field duplicate samples together:

- If both samples have detected values (flagged with "J" or unflagged), both values were averaged together. If one value or both values are flagged with "J" prior to averaging, the resulting averaged value was flagged with "J".
- If both samples have nondetected values (flagged with "U" or "UJ"), the lower value and its flag were used.
- If one sample has a nondetected value (flagged with "U" or "UJ") and the other sample has a detected value (flagged with "J" or unflagged) the following is done:
 - If the detected value is less than or equal to the nondetected value, the detected value and its flag were used; or
 - If the detected value is greater than the nondetected value, the detected value and 1/2 the nondetected value were averaged together. The resulting averaged value was flagged with "J".

- If one sample has a nonrejected value (flagged with "J", "U", "UJ" or unflagged) and one sample has a rejected value (flagged with "R" or "UR"), the nonrejected value and its flag were used.

The range of detection limits was determined based on the individual sample-specific detection limit (or sample quantitation limit; SQL) for each analyte. Because of sample dilution and/or sample weights, laboratory detection limits for individual samples can be higher than the method-specified detection limits. Minimum and maximum SQLs were determined for each analyte using each sample's SQL for all samples analyzed, regardless of whether the analyte was detected in any particular sample.

The frequency of detection is the number of samples with detected values per the number of samples analyzed. The number of samples with detected values was determined by totaling all samples with detected values (flagged with "J" or unflagged). The number of samples analyzed was determined by totaling all samples with detected or nondetected values (flagged with "U", "UJ", "J" or unflagged). Rejected values (flagged with "R" or "UR") were not included in the total number of samples analyzed. The mean of the field duplicate sample and corresponding sample was included when determining the number of samples analyzed and the number of detected values.

Arithmetic mean concentrations and 95% Upper Confidence Limits (UCLs) were calculated using all detected values (flagged with "J" or unflagged) and $\frac{1}{2}$ of the SQL for non-detected values (flagged with "U" or "UJ"). In some cases, the mean or 95% UCL was greater than the maximum value because of high or widely varying detection limits, because a detected value is below the SQL (flagged with "J" on the laboratory report), or because a small dataset was used. Detected values below the SQL are considered to be estimated concentrations, but are used in the risk assessment.

APPENDIX 6F

**CHROMIUM VI ANALYTICAL RESULTS AND DATA
VALIDATION REPORTS**



TETRA TECH NUS, INC.

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RACI-EPA-4237

Contract No. 68-W6-0045

December 4, 2002

Mr. Joseph LeMay, P. E.
U. S. Environmental Protection Agency
1 Congress Street, Suite 1100 (HBO)
Boston, Massachusetts 02114-2203

Subject: Hexavalent Chromium in Sediments
Industri-plex Site, Remedial Investigation/Feasibility Study
RAC I W.A. No. 116-RICO-0107

Dear Mr. LeMay:

In response to your request, Tetra Tech NUS, Inc. (TtNUS) has further evaluated the presence of hexavalent chromium in sediment samples collected from wetlands at Wells G & H and the Halls Brook Holding Area (HBHA).

On January 9, 2002, TtNUS issued a letter to your office responding to comments provided to you by the EPA's New England Regional Laboratory (NERL) regarding analytical methods and results for sediment samples analyzed for hexavalent chromium (Cr+6) under Case 0194H, SDG D02645. These samples were collected to support the Industri-plex Site Remedial Investigation/Feasibility (RI/FS) for Operable Unit 2 (OU-2).

As detailed in the response letter, it was TtNUS' opinion that due to the limitations of SW-846 colorimetric Method 7196A, the ion chromatography Method 7199 would be a better analytical alternative to overcome possible matrix interferences when measuring hexavalent chromium in anoxic sediment samples. Further, the presence of hexavalent chromium in the wetland sediments was also in question due to the reducing conditions observed in the sediments.

To provide additional information, EPA requested that TtNUS re-sample areas where previous analytical results indicated elevated concentrations of total chromium. On October 8, 2002, TtNUS collected six additional sediment samples from areas within the Wells G & H wetland and the HBHA. These samples were analyzed for sulfides, pH, ORP, total metals and hexavalent chromium using the alternative ion chromatography Method 7199.

The analytical results were presented in data validation reports submitted to your office on November 20 and 21st, 2002 (see attached). The following table summarizes the concentrations of total chromium and hexavalent chromium detected in these samples.

	<i>WH-02</i>	<i>WG-10</i>	<i>WS-08</i>	<i>CB03-06</i>	<i>CB03-10</i>	<i>WW-06</i>
Total Cr (mg/kg)	930	249	244	755	253	13,400
Cr+6 (mg/kg)	ND	ND	ND	ND	ND	17.3



TETRA TECH NUS, INC.

Mr. Joseph LeMay, P. E.
U. S. Environmental Protection Agency
December 4, 2002
Page 2 of 2

The data supports TtNUS' opinion that it is unlikely that hexavalent chromium exists in wetland sediments where elevated sulfide concentrations and reducing conditions are present. Hexavalent chromium was only present at very low concentrations in sample WW-06 that contained a total chromium concentration of 13,400 mg/kg.

Similar reducing conditions (based on ORP, sulfide, and pH values) have been generally observed through all areas of the wetlands that have been previously sampled. Currently, there is not enough data to develop a statistical correlation between total chromium and hexavalent chromium. However, it is reasonable to assume that based on the geochemistry of the wetland sediments, hexavalent chromium may only be present in areas with elevated total chromium concentrations, but would exist at very low concentrations. Consequently, it would be unreasonably conservative to assume that all of the total chromium is in the hexavalent form when using the data for risk assessment purposes.

If you have any questions or should require additional information, please call me 978-658-7899.

Very truly yours,

Gordon H. Bullard
Project Manager

PMO -

GHB:rp

Enclosures

c: H. Horahan (EPA) w/o enc.
G. Gardner/A. Ostrofsky (TtNUS) w/o enc.
L. Guzman (TtNUS) w/enc.
File N4123-1.0 w/enc.



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RAC1-EPA-4226

Contract No. 68-W6-0045

November 20, 2002

Ms. Christine Clark
Regional Sample Control Coordinator
U.S. EPA New England Regional Laboratory
Office of Environmental Measurement and Evaluation
11 Technology Drive
North Chelmsford, Massachusetts 01863-2431

Subject: Tier III Inorganic Data Validation, W.A. No. 116-RICO-0107
DAS Case 0331H, SDG D08379-IA
Southwest Research Institute
Industri-Plex Site, Woburn, Massachusetts

Hexavalent Chromium/Total Sulfide:
7/Sediments/ D08379, D08380, D08381, D08382, D08383, D08384,
D08385
(Field Duplicate Pair: D08383/D08384)

Dear Ms. Clark:

Tetratech NUS, Inc. (TtNUS) performed a Tier III data validation for the hexavalent chromium and total sulfide data for DAS Case 0331H, SDG D08379-IA, from sediment samples collected by TtNUS at the Industri-Plex site. The hexavalent chromium analysis was performed by the SW-846 Methods 3060A/7199. The sulfide analysis was performed by Methods 9030B/9034. These methods were required by TtNUS Technical Specification S02-RAC1-240. Modifications and special technical requirements were issued in order to compensate for the low percent solids of the samples. The Tier III data validation was performed as required in the April, 2002 Quality Assurance Project Plan. The data were validated according to the Region I, EPA-NE Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses, modified February 1989.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times
- * • Calibration Verification
- * • Field and Laboratory Blank Analyses
- Matrix Spike Recoveries
- * • Laboratory Control Sample Results
- * • Laboratory Duplicate Results
- * • Field Duplicate Precision
- * • Detection Limits
- * • Sample Quantitation

* - All quality control criteria were met for this parameter.

Table I summarizes the validation recommendations, which were based on the following information:

Data Completeness

The laboratory was contacted on November 7, 2002, about a missing Form DC-2 (CSF Inventory Sheet) and some errors in the SDG Narrative. The Form DC-2, some additional shipping documents, and a revised Narrative were received on November 20, 2002.

The laboratory was also contacted on November 7, 2002, about the hexavalent chromium ion chromatography calibration curve, which did not fit the reported results. The laboratory responded on November 11, 2002, that it had used a linear curve but had inadvertently submitted a quadratic curve. The response included the linear equation. The revised linear curve printout was received on November 20, 2002.

Holding Times

Hexavalent Chromium

The hexavalent chromium samples were digested within the 7-day holding time. However, according to the Technical Specification, the digestates were to be analyzed within 2 hours of digestion. The laboratory indicated in the SDG Narrative that this was not possible because the filtration process took about 6 hours due to the sample matrix. The analysis of the samples was completed in about 9 hours.

Although the required holding time for analysis was exceeded, professional judgement was used to take no action for this parameter. According to Method 3060A, Section 6.4, hexavalent chromium "has also been shown to be stable in the alkaline digestate for up to 168 hours after extraction from soil."

Sulfide, pH, and ORP

The holding times were met for sulfide, pH, and ORP.

Matrix Spike Recoveries

Hexavalent Chromium

The recoveries for the low-level soluble hexavalent chromium matrix spike and matrix spike duplicate (MS/MSD) analysis, and for the high-level insoluble MS/MSD analysis of sample D08380 were 0 percent. Professional judgement was used not to qualify the data for this parameter since the percent recoveries for the soluble and insoluble hexavalent chromium LCS are within criteria, and the oxidation/reduction potential (ORP) and pH values indicate matrix reducing characteristics for sample D08380. In addition, as indicated by the laboratory in the Narrative, the samples contained high amounts of organic matter and sulfide. The combined and interacting influences of ORP, pH, and reducing agents (organic acids, iron II, and sulfides)

may have reduced the hexavalent chromium spikes (Section 8.5.1 of Method 3060A). As per the above reference, if the ORP (Eh) and pH of the sample fall within the reducing area, as illustrated in Figure 2 of Method 3060A (enclosed), low matrix spike recoveries are expected for these samples.

Sulfide

The recoveries for the sulfide matrix spike and matrix spike duplicate analysis of sample D08379 were below the 75 percent recovery criterion. The positive sulfide results are estimated (J) in all samples. The results may be biased low.

Post Digestion Spike Recoveries

As required by the technical specification, the laboratory performed a post-digestion spike for each hexavalent chromium sample. The results were all within the 85-115 QC criteria. Therefore, no Method of Standard Additions was required.

The good recoveries of the post-digestion spikes in the presence of reducing compounds may be due to the high pH of the Method following the digestion. According to Method 7199, Section 3.1.2, "Reduction of Cr(VI) to Cr(III) can occur in the presence of reducing species in an acidic medium. However, at a pH of 6.5 or greater, CrO_4^{2-} , which is less reactive than the HCrO_4^- , is the predominant species." The high pH of the digestate before the diphenylcarbazide is added may slow the reduction reaction, allowing the Cr(VI) to react with the diphenylcarbazide to form the color complex before the Cr(VI) is reduced.

Laboratory Control Sample Results

Hexavalent Chromium

The laboratory control sample (LCS) results were within limits for soluble and insoluble hexavalent chromium. A trivalent chromium LCS was also analyzed for hexavalent chromium to ascertain whether the hexavalent chromium results could be biased high due to oxidation of trivalent chromium to the hexavalent form caused by the alkaline digestion method. (See Method 3060A, Section 3.3.) The recovery of hexavalent chromium from the trivalent chromium LCS was 0 percent. Therefore, there does not appear to be an oxidation effect caused by the digestion method.

Sulfide

The sulfide LCS results were within limits.

Sample Quantitation

Hexavalent Chromium

The percent solids were below 30 percent for all of the sediment samples, and below 10 percent for two samples. The laboratory compensated for the low percent solids by increasing the amount of sample analyzed. Method 3060A requires 2.5 g of field-moist sample. The laboratory used sample weights of about 20 g; however, due to the dark color, all samples were

diluted 10x. Professional judgement was used not to qualify the sediment sample results based on the low percent solids of the samples because of two main reasons: (a) the sensitivities (MDL) of the alkaline digestion/ion chromatography procedures are much lower than the required quantitation limit, and (b) the water from the sludge sample evaporates during the first minutes of the alkaline digestion and does not interfere with the analysis.

Sulfide

The laboratory compensated for the low percent solids by using the maximum amount of moist solid sample allowable in Method 9030B (50 g), but the required quantitation limit of 2 mg/kg was not achieved. Professional judgement was used not to qualify the sulfide data based on the low percent solids since all of the sulfide results were well above the required quantitation limit. In addition, Method 9030B specifies analyzing an amount of sample that contains 0.2 to 50 mg of sulfide. The amounts of sulfide contained in the sample aliquots were within this range for all of the samples.

Overall Assessment of the Data

Hexavalent Chromium

The hexavalent chromium data are accepted without qualification.

Sulfide, pH, ORP

The positive sulfide results are qualified as estimated (J) in all samples due to the low MS/MSD recoveries. The results may be biased low.

The pH and ORP data are accepted without qualification.

Sincerely,



Ann L. Franke
Data Validator



Lucy Guzman
RAC I Lead Chemist

PMO - @

Ms. Christine Clark
November 20, 2002
Page 5

Tables: Table I: Recommendation Summary Tables
 Eh/pH Diagram (Figure 2 from Method 3060A)
 Data Summary Tables

Enclosures: Data Validation Worksheets
 Communication/Phone Logs
 Field Notes
 Technical Specification No. S02-RAC1-240
 CSF Audit (DC-2 Form)
 DQO Summary Form

c: J. LeMay (EPA) w/o enc.
 G. Bullard (TtNUS) w/o enc.
 File N4123-2.6 w/ enc.

**INDUSTRI-PLEX SITE
DAS Case 0331H, SDG D08379-IA**

Table I - Recommendation Summary for the Sediment Samples

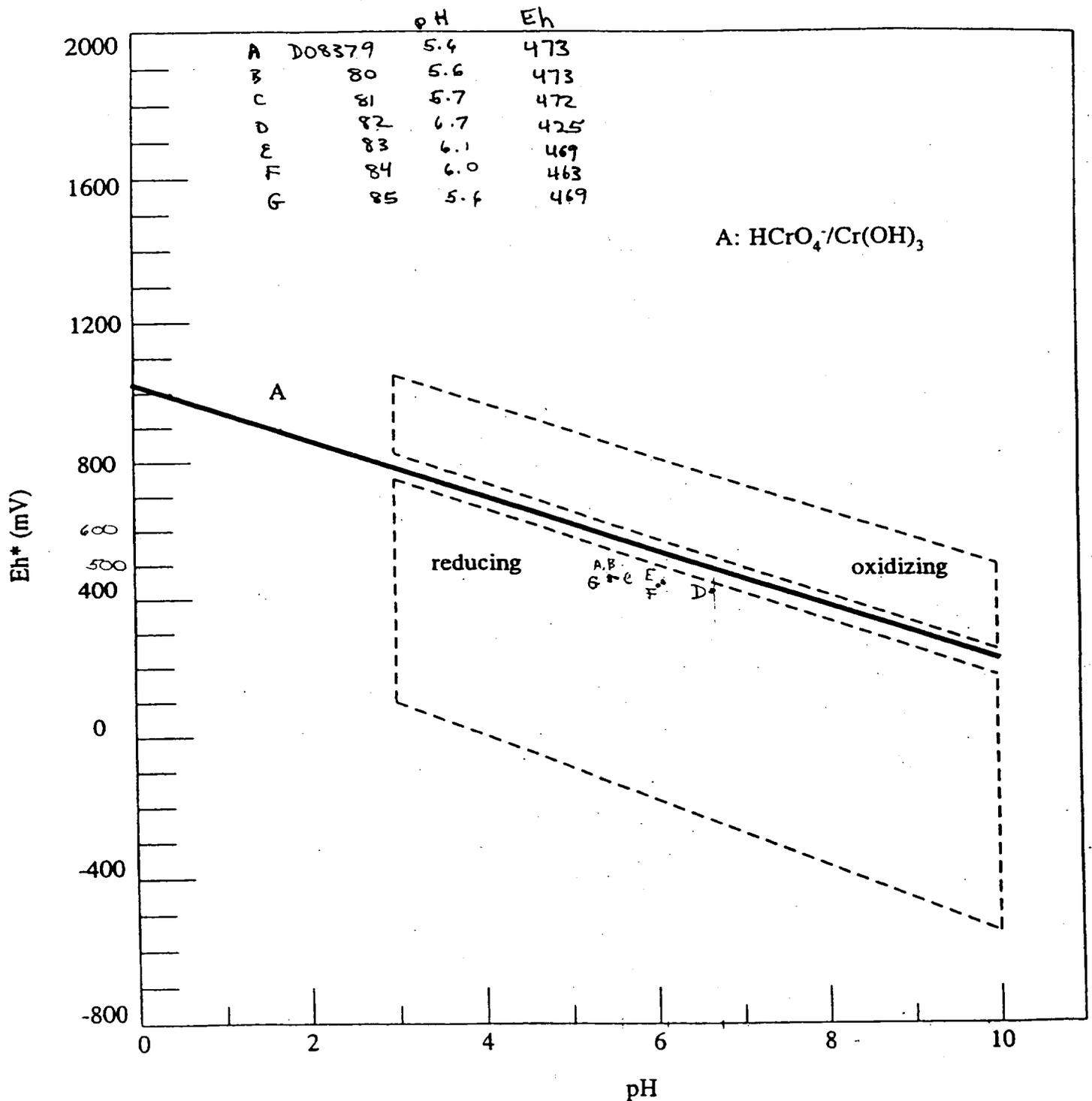
Hexavalent Chromium	A
Total Sulfide	J ¹
ORP	A
pH	A

A - Accept the data.

J¹ - Estimate (J) positive results in all samples due to low matrix spike and matrix spike duplicate recoveries. Results may be biased low.

FIGURE 2
Eh/pH PHASE DIAGRAM

The dashed lines define Eh-pH boundaries commonly encountered in soils and sediments.



* Note the Eh values plotted on this diagram are corrected for the reference electrode voltage: 244 mV units must be added to the measured value when a separate calomel electrode is used, or 199 mV units must be added if a combination platinum electrode is used.

Soil Wet Chemistry Analysis
 Site: Industri-Plex
 Case: 0331H; SDG: D08379-IA

EPA Sample Number	D08379	D08380	D08381	D08382	D08383
Station Location	IPSD-WH02-100802	IPSD-WG10-100802	IPSD-WS08-100802	IPSD-CB0306-100802	IPSD-CB0310-100802
Date Sampled	10/8/2002	10/8/2002	10/8/2002	10/8/2002	10/8/2002
Date Extracted					
Date Analyzed					
Dilution Factor	10	10	10	10	10
Percent Solids	11.5	13.0	7.69	5.83	13.7
QC Identifier	None	None	None	None	Field Dup. IPSD-CB0310-100802
Chromium VI (mg/kg)	0.859 U	0.777 U	1.51 U	1.98 U	0.830 U
Sulfide (mg/kg)	153 J	49.0 J	340 J	10100 J	554 J
pH (S.U.)	5.65	5.63	5.68	6.72	6.10
Redox Potential (Eh)(mV)	473	473	472	425	469

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate
 Note: Dilution Factor applies only to Chromium VI analysis

Soil Wet Chemistry Analysis
 Site: Industri-Plex
 Case: 0331H; SDG: D08379-IA

EPA Sample Number	D08384	D08385
Station Location	IPSD-DP01-100802	IPSD-WW06-100802
Date Sampled	10/8/2002	10/8/2002
Date Extracted		
Date Analyzed		
Dilution Factor	10	10
Percent Solids	13.5	11.2
QC Identifier	Field Dup. IPSD-CB0310-100802	None
Chromium VI (mg/kg)	0.817 U	17.3
Sulfide (mg/kg)	530 J	262 J
pH (S.U.)	6.050	5.57
Redox Potential (Eh)(mV)	463	469

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate
 Note: Dilution Factor applies only to Chromium VI analysis



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RAC1-EPA-4227

Contract No. 68-W6-0045

November 21, 2002

Ms. Christine Clark
Regional Sample Control Coordinator
U.S. EPA New England Regional Laboratory
Office of Environmental Measurement and Evaluation
11 Technology Drive
North Chelmsford, Massachusetts 01863-2431

Subject: Tier III Inorganic Data Validation, W.A. No. 116-RICO-0107
DAS Case 0331H, SDG D08379-IB
Southwest Research Institute
Industri-Plex Site, Woburn, Massachusetts

Total Metals:
7/Sediments/ D08379, D08380, D08381, D08382, D08383, D08384,
D08385
(Field Duplicate Pair: D08383/D08384)

Dear Ms. Clark:

Tetrattech NUS, Inc. (TtNUS) performed a Tier III data validation for the total metals analytical data for DAS Case 0331H, SDG D08379-IB, from sediment samples collected by TtNUS at the Industri-Plex site. The samples were digested and analyzed according to the EPA SW-846 Methods 3050B/6010B, modified to increase the sample size to compensate for the low percent solids of the samples. The Tier III data validation was performed as required in the April, 2002 Quality Assurance Project Plan. The data were validated according to the Region I, EPA-NE Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses, modified February 1989.

The data were evaluated based on the following parameters:

- Data Completeness
- * • Holding Times
- Calibration Verification
- * • Field and Laboratory Blank Analyses
- ICP Interference Check Sample Results
- * • Matrix Spike Recoveries
- * • Laboratory Control Sample Results
- Laboratory Duplicate Results
- * • Field Duplicate Precision
- NA • Furnace Atomic Absorption Results
- * • ICP Serial Dilution Results
- * • Detection Limits

- Sample Quantitation
- NA • Performance Evaluation Sample Results

* - All quality control criteria were met for this parameter.

Table I summarizes the validation recommendations, which were based on the following information:

Data Completeness

These sediment samples were collected for hexavalent chromium analysis; however, EPA requested this additional total metals analysis after receiving the hexavalent chromium results. Only ICP metals were requested (no mercury). Total metals analysis is not listed in the chain-of-custody form. A performance evaluation (PE) sample was not included for these samples.

The laboratory was contacted on November 7, 2002, about a missing Form DC-2 (CSF Inventory Sheet). The Form DC-2 and some additional shipping documents were received on November 20, 2002.

The laboratory was contacted on November 20, 2002, about the reason for the low sample weight of sample D08379. The laboratory responded on November 20, 2002, that there was insufficient sample remaining after the wet chemistry analysis of this sample.

Calibration Verification

The percent recoveries for selenium and thallium were outside the 80-120 percent quality control (QC) criteria in the CRDL standard analysis. The positive selenium results less than 3x CRDL are qualified as estimated (J) due to a high recovery. The results may be biased high. The positive thallium result less than 3x CRDL in sample D08384, and the non-detected thallium results in the remaining samples are estimated (J, UJ) due to high and low recoveries. The bias in these results is uncertain.

ICP Interference Check Sample Results

Positive results for thallium was detected in the ICSA solution at absolute levels greater than 2x IDL when this metal was not supposed to be present in the solution. These results may be due to ICP interference if the concentration of aluminum, calcium, iron, and magnesium in any field sample is $\geq 50\%$ of the ICS solution concentration. The estimated ICP interference for each affected metal in the field sample is calculated, and the following actions are taken:

- If the calculated interference is positive, estimate (J) positive results and accept non-detected results for the affected metals. Reject (R) positive results if the reported concentration is due entirely ($\geq 80\%$) to the ICP interference.
- If the calculated interference is negative, estimate (J, UJ) positive and non-detected results for the affected metals.

- If the calculated interference is less than 1% of the sample concentration reported for the affected metal, the ICP interference is considered negligible and no action is taken.

The sample listed in the table below had iron at a level greater than 50% of its respective level in the ICSA solution. Therefore, the following action was taken:

Sample	Affected Metal	Sample Concentration (µg/L)	Sample Concentration, Interferent (µg/L) - Fe	Estimated Interference (µg/L)	Action
D08384	Thallium	23.0*	146200*	71.6	Reject

* - Both thallium and iron were reported from a 5 times dilution analysis. These values are the diluted results before adjustment for the dilution factor.

The positive thallium result is rejected (R) in sample D08384 since the reported concentration might be due entirely to the positive iron ICP interference.

Chromium was reported at concentration greater than 10 mg/L in sample D08385. The estimated ICP interference of chromium on arsenic is greater than 10 percent of the reported arsenic concentration in this sample, and also is greater than 2x CRDL of arsenic. The positive arsenic result in sample D08385 is estimated (J) due to positive chromium ICP interference. The result may be biased high.

Laboratory Duplicate Results

The absolute difference (RPD) for thallium was greater than the 2x CRDL QC criterion for sediment samples in the laboratory duplicate analysis of sample D08382. The non-detected thallium results are estimated (UJ) in the sediment samples due to poor laboratory duplicate precision. The bias is undetermined. The positive thallium result in D08384 was previously rejected, and no further action is needed.

Sample Quantitation

The percent solids of all of the samples were below 30 percent. For all samples except D08379, the laboratory adequately compensated for the low percent solids by increasing the amount of sample analyzed. Therefore, no action is taken.

For sample D08379, the amount of sample analyzed was less than one gram due to the small amount of sample remaining after the wet chemistry analysis. The laboratory compensated for the low percent solids by decreasing the final volume used. However, the amount of sample analyzed may have not been representative of the sample location. Professional judgement was used to estimate (J) all positive results and reject (R) all non-detected results in sample D08379 due to the small amount of sample analyzed.

Overall Assessment of the Data

The positive selenium results less than 3x CRDL are qualified as estimated (J), and the non-detected thallium results are estimated (UJ) due to poor linearity near the CRDL. The selenium results may be biased high. The bias of the thallium results is uncertain.

The positive thallium result is rejected (R) in sample D08384 since the reported concentration might be due entirely to positive iron ICP interference.

The positive arsenic result in sample D08385 is estimated (J) due to positive chromium ICP interference. The result may be biased high.

The non-detected thallium results are estimated (UJ) due to poor laboratory duplicate precision. The bias is undetermined.

All positive metals results are estimated (J), and the non-detected results for beryllium, silver, and thallium are rejected (R), in sample D08379 because the small amount of sample analyzed may have not been representative.

Sincerely,



Ann L. Franke
Data Validator



Lucy Guzman
RAC I Lead Chemist

PMO - 

Tables: Table I: Recommendation Summary Tables
Data Summary Tables

Enclosures: Data Validation Worksheets
Communication/Phone Logs
Field Notes (in Case 0331H, SDG D08379-IA)
CSF Audit (DC-2 Form)
DQO Summary Form

c: J. LeMay (EPA) w/o enc.
G. Bullard (TtNUS) w/o enc.
File N4123-2.6 w/ enc.

**INDUSTRI-PLEX SITE
 DAS Case 0331H, SDG D08379-IB**

Table I - Recommendation Summary for Total Metals Sediment Samples

Aluminum	J ⁴	Magnesium	J ⁴
Antimony	J ⁴	Manganese	J ⁴
Arsenic	J ^{3,4}	Mercury	NA
Barium	J ⁴	Nickel	J ⁴
Beryllium	R ²	Potassium	J ⁴
Cadmium	J ⁴	Selenium	J ^{1,4}
Calcium	J ⁴	Silver	R ²
Chromium	J ⁴	Sodium	J ⁴
Cobalt	J ⁴	Thallium	J ² , R ^{1,2}
Copper	J ⁴	Vanadium	J ⁴
Iron	J ⁴	Zinc	J ⁴
Lead	J ⁴		

NA – Not analyzed.

- J¹- Estimate (J) the positive results <3x CRDL due to poor linearity near the CRDL. Results may be biased high.
- J²- Estimate (UJ) the non-detected results due to poor linearity near the CRDL and due to poor laboratory duplicate precision. The bias based on both parameters is uncertain.
- J³- Estimate (J) the positive result in sample D08385 due to positive chromium ICP interference. The result may be biased high.
- J⁴- Estimate (J) the positive results in sample D08379 due to the small amount of sample analyzed.
- R¹- Reject (R) the positive result in sample D08384 since the result may be due entirely to positive iron ICP interference.
- R²- Reject (R) the non-detected results in sample D08379 due to the small amount of sample analyzed.

SOIL METAL ANALYSIS BY METHOD 6010B (MG/KG)

Site: Industri-Plex

Case: 0331H; SDG: D08379-IB

EPA Sample Number	D08379	D08380	D08381	D08382	D08383
Station Location	IPSD-WH02-100802	IPSD-WG10-100802	IPSD-WS08-100802	IPSD-CB0306-100802	IPSD-CB0310-100802
Date Sampled	10/8/2002	10/8/2002	10/8/2002	10/8/2002	10/8/2002
Date Extracted					
Date Analyzed					
Dilution Factor	5	2	1	1	1
Percent Solids	11.5	13.0	7.7	5.8	13.7
QC Identifier	None	None	None	None	Field Dup. IPSD-CB0310-100802
Aluminum	30500 J	13300	4180	13800	5510
Antimony	45.3 J	13.0	2.8	6.4	2.9
Arsenic	909 J	173	64.5	497	200
Barium	200 J	102	97.9	116	71.5
Beryllium	R	1.5 U	1.2 U	1.6 U	0.72 U
Cadmium	20.1 J	5.6	6.6	28.0	22.3
Calcium	28300 J	17700	16000	13900	16300
Chromium	930 J	249	244	755	253
Cobalt	31.5 J	25.1	10.5	105	8.4
Copper	1010 J	276	186	658	186
Iron	127000 J	51500	19900	67600	22700
Lead	2470 J	649	194	454	171
Magnesium	7870 J	2650	1690	4250	2320
Manganese	657 J	1300	724	961	81.2
Nickel	70.0 J	33.8	20.8	66.6	21.6
Potassium	2660 J	570	528	1110	627
Selenium	8.8 J	4.3 J	5.1	5.0	3.7
Silver	R	1.5 U	1.2 U	1.6 U	0.72 U
Sodium	2840 J	787	1580	1620	855
Thallium	R	6.1 UJ	4.8 UJ	6.5 UJ	2.9 UJ
Vanadium	240 J	88.3	26.5	66.8	101
Zinc	3300 J	815	813	4880	1730

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;

R - Rejected

Soil TAL Metal Analysis By Method 6010B (mg/kg)

Site: Industri-Plex

Case: 0331H; SDG: D08379-IB

EPA Sample Number	D08384	D08385	
Station Location	IPSD-DP01-100802	IPSD-WW06-100802	
Date Sampled	10/8/2002	10/8/2002	
Date Extracted			
Date Analyzed			
Dilution Factor	1	1	
Percent Solids	13.5	11.2	
QC Identifier	Field Dup. IPSD-CB0310-100802	None	
Aluminum	5130	9360	
Antimony	3.1	4.2	U
Arsenic	208	41.5	J
Barium	67.9	198	
Beryllium	0.72	0.84	U
Cadmium	22.4	5.6	
Calcium	19800	14900	
Chromium	234	13400	
Cobalt	9.6	10.8	
Copper	177	310	
Iron	21000	10500	
Lead	158	369	
Magnesium	2190	2200	
Manganese	76.7	233	
Nickel	21.5	25.8	
Potassium	599	375	
Selenium	3.8	4.3	
Silver	0.72	0.84	U
Sodium	832	561	
Thallium		3.4	UJ
Vanadium	101	79.4	
Zinc	1910	1180	

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
R - Rejected



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RACI-EPA-3520

Contract No. 68-W6-0045

January 9, 2002

Mr. Joseph LeMay, P.E.
U.S. Environmental Protection Agency
1 Congress Street, Suite 1100 (HBO)
Boston, Massachusetts 02114-2203

Subject: Response to EPA June 13, 2001 Memorandum Re: Chromium VI Data
Industri-plex Site, Remedial Action Oversight
RAC I W.A. No. 104-RXBF-0107

Dear Mr. LeMay:

Pursuant to your request, Tetra Tech NUS, Inc. (TtNUS) is providing responses to comments provided to you by EPA's New England Regional Laboratory (NERL) regarding analytical methods and results for sediment samples analyzed for hexavalent chromium (Cr+6) under Case 0194H, SDG D02645. Samples were collected to support the Industri-plex Site Remedial Investigation/Feasibility (RI/FS) for Operable Unit 2 (OU-2).

BACKGROUND

In February 2001, TtNUS collected 30 sediment samples for total metals analysis from a wetlands located within the Industri-plex Site study area. Twenty percent of these samples were randomly selected and analyzed for Cr+6 by SW-846 Methods 3060A and 7196A in accordance with TtNUS Specification No. S01-RAC1-0152. The initial results for these samples indicated elevated concentrations of Cr+6. These results were not expected because; 1) previous sediment samples collected in similar environments within the site study area did not show the presence of Cr+6, and 2) the observed oxidation reduction potential (ORP) and pH reducing conditions for these sample matrices should have precluded the presence of Cr+6. As a result, EPA requested that TtNUS resample three areas where the highest concentrations were observed to confirm the presence of Cr+6. TtNUS re-sampled three locations in June 2001. The analytical results for the re-sampled areas indicated that Cr+6 was not detected.

Based on the conflicting data and at your request, EPA's Quality Assurance Office conducted an independent review of the analytical data and data validation reports prepared by TtNUS. Enclosed, please find the TtNUS' responses to EPA's comments.

Since June 2001, TtNUS has conducted an extensive review of the data and worked very closely with Dr. Neil Pothier (Ceimic Corporation) to evaluate the analytical methods, the potential analytical interferences that are inherent with the method, the effects of strong reducing conditions within the sample matrix, potential analytical errors, and possible impacts to the sample results. This evaluation has shown that the selected analytical method has a high potential for matrix interferences that may result in false-positive results for Cr+6.

Strong reducing conditions, as observed in the site sediment sample matrix, may also have a significant impact on the matrix spike recoveries, post-digestion spike recovery, and validity of the method of standard addition (MSA). In the presence of strong reducing conditions, the Cr+6



TETRA TECH NUS, INC.

Mr. Joseph LeMay, P.E.
January 9, 2002
Page 2 of 2

spike could be reduced to trivalent chromium (CR+3) and the low spike recoveries could be incorrectly interpreted as poor analytical performance, thus rendering the data as unreliable.

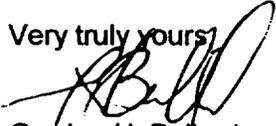
Finally, TtNUS discovered that the laboratory had made several calculation errors which led to originally reporting incorrect values for Cr+6. These errors have since been corrected and a revised data validation report was issued on December 31, 2001 (see enclosure). This revised data validation report also describes in detail and addresses several of the issues discussed by NERL, specifically low spike recoveries. The data validation report also discusses technical issues with the applicability of using SW-846 Methods 3060A and 7196A for these particular sample matrices from this site (i.e. samples with reducing conditions, high concentration of sulfides, etc.).

As stated in the revised data validation report, "For these sediment samples, there is not enough information available to determine whether the low matrix spike recovery, the low post-digestion spike recoveries, and the failed MSA are due solely to the reducing characteristics of the sediment samples or due to other matrix interference effects, potential laboratory analytical errors, or a combination of all these factors. The accuracy of the low concentration positive values and non-detected results obtained directly from the colorimetric analysis can not be determined with the analytical information available. Therefore professional judgement was used to reject the positive and non-detected results for all samples except D02673 and D02679.

Due to the limitations of SW-846 Methods 3060A and 7196A, the ion chromatography method (Method 7699) is suggested as an alternative method, to overcome possible matrix interference when measuring hexavalent chromium in anoxic sediment samples. In addition to pH, ORP, and sulfides analyses, other ancillary parameters such as total organic carbon (TOC), biochemical oxygen demand (BOD), and chemical oxygen demand (COD) may also be useful to characterize each sample and assist in the interpretation of the quality control data outside the conventionally accepted criteria.

If you have any questions or should require additional information, please call me or Ms. Lucy Guzman at 978-658-7899.

Very truly yours,


Gordon H. Bullard
Project Manager

PMO - @

GHB:rp

Enclosures

c: H. Horahan (EPA) w/o enc.
L. Guzman (TtNUS) w/enc.
G. Gardner/A. Ostrofsky (TtNUS) w/o enc.
File N4123-1.0 w/ enc.

RESPONSES TO EPA COMMENTS
JUNE 13, 2001
EVALUATION OF THE HEXAVALENT CHROMIUM DATA

Comment 1. The Technical Specification Analysis of Soil Samples for Hexavalent Chromium and Total Sulfides, Delivery of Analytical Services by Tetra Tech NUS, Inc. dated August 2000 does not include provisions for sediment sample analysis, specifically accounting for the low percent solids in sediment samples. Region I requires the rejection of data reported for samples with percent solids which are less than 10% and estimate all positive results and reject non-detects for samples with percent solids greater than 10% and less than or equal to 30%. The Tetra Tech data validation procedures did not include this requirement.

Therefore, the Cr(VI) data for the following samples are rejected due to percent solids less than 10%: D02672, D02687.

The Cr(VI) data, which was reported as non-detected, for the following samples are rejected due to percent solids greater than 10% and less than or equal to 30%: D02673, D02679.

The Cr(VI) data, which are reported as positive results, for the following sample are estimated due to percent solids greater than 10% and less than or equal to 30%: D02649, D02650, D02697, D02718, D02722, D02727, D02729, and D02734.

Response: TtNUS does not technically agree with the application of this particular EPA Region I data validation rule to the colorimetric procedure for several reasons:

- a) Unlike CLP procedures for solids that are typically only applicable to soil samples (i.e. low moisture content), the alkaline digestion method (Method 3060A) is applicable to various matrices including high moisture content (i.e. low percent solids) samples such as sediments and sludges.
- b) The method detection limit (MDL) for Methods 3060A/7196A is much lower than the required project quantitation limit. Consequently, even if the sample has only 10 percent solids (equivalent to a 1:10 dilution) the laboratory will be able to achieve the project goal for sensitivity.
- c) The water from the sediment sample evaporates during the first minutes of the alkaline digestion process and does not interfere with the analysis.
- d) Several problems were encountered when increasing the sample aliquot to compensate for the high moisture of the sediment samples:
 - The alkaline digestate for several samples became very thick and impossible to filter.
 - The digested extract was very dark and needed to be diluted before completing the colorimetric analysis by Method 7196A.
 - The color-developed sample aliquot is measured against a non-color reagent added background sample. If the sample is dark, the background sample absorbance may be greater than the absorbance of the sample resulting in negative values.

Comment 2. The Tetra Tech NUS, Inc. data validation report did not indicate that the laboratory did not provide the bench sheets for sample digestion. The Method 3060A indicates the importance of checking the pH of the digestion solution prior to digesting the samples. The data package did include the logbook pages for performing the pH analysis of the samples, however the digestion solution was not included in these logbook pages. The logbook pages which demonstrate that the digestion heating devices were maintained at the method required 90-95°C temperature were not provided. Therefore, the digestion procedure cannot be verified.

Response: EPA is correct, the laboratory did not provide a sample digestion worksheet. TtNUS agrees that this information would be useful in evaluating the uncertainty of possible analytical error. TtNUS will require this documentation in future work.

Comment 3. The digestion pH was not optimized. The Region has found that a pH optimization procedure must be performed prior to preparing and analyzing samples for Cr(VI) determination. Several spikes containing Cr(VI), soluble and insoluble, and Cr(III) must be spiked on field samples at a range of pHs to determine the appropriate pH to recover the Cr(VI) in the matrix under investigation.

An extensive digestion pH study was previously performed on soil and sediment samples from this site. The data from this study can be found in data validation reports for Case numbers 0156H, SDG 02227, and for the soils in Case 0157H, SDG D02203.

The pH optimization procedure may not be applicable in all circumstances, especially in sample matrices exhibiting strong reducing characteristics, as observed in the site sediment samples. As demonstrated by the previous study, all of the hexavalent chromium (CR+6) spike was reduced to trivalent chromium (CR+3) and the digestion pH had no affect on the recovery of the Cr+6. Based on the previous study results, it was determined that the optimum pH for samples from this site was consistent with the pH required by Method 3060A. Furthermore, the preliminary results from the recent analysis of similar site sediment samples by ion chromatography, Method 7699, indicate that the pH required by the alkaline digestion Method 3060A is also appropriate to digest insoluble CR+6 spikes.

Comment 4. The Tetra Tech NUS, Inc. data validation report indicates that the laboratory did not perform a laboratory duplicate analysis. Sample D02645 and its duplicate were included in the analysis log on page 41/42.

Sample D02645 was analyzed in duplicate as shown in the analysis log on page 42. However, the laboratory did not perform the method of standard additions (MSA) on the laboratory duplicate.

Comment 5. The Tetra Tech NUS, Inc. technical specification does not include a spike containing Cr(III) to determine that the procedure is not converting the Cr(III) to Cr(VI). The ORP and pH results indicate a reducing atmosphere which is contrary to the number of positive results which are reported for Cr(VI). The Tetra Tech data validation does indicate that the soluble matrix spike was recovered at 1% and the insoluble matrix spike was recovered at 70% which are low recoveries. This fact indicates that the digestion procedure may not be at the

appropriate pH for adequate recovery of Cr(VI) in this particular matrix. It must be noted that the insoluble Cr(VI) was spiked at approximately 100 times the concentration of the soluble Cr(VI) spike. A seventy five percent recovery is the lower acceptance limit. All Cr(VI) data should be estimated due to the low matrix spike recoveries. It also must be considered that twelve out of seventeen sample results were determined with method of standard addition (MSA) due to poor recovery of the post digestion spike which may indicate that the digestion pH may not be appropriate. The samples with low post digestion spike recoveries and MSA results with curves which did not meet criteria were rejected. This includes samples: D02649, D02650, D02692, D02697, D02705, D02729 and D02734.

Response: Regarding the first part of this comment addressing the Cr+3 spike, the previous study that was conducted to optimize the digestion pH for samples from this site included spiking with Cr+3. The results did not indicate oxidation of the Cr+3 to Cr+6. Also, note that as further precaution against the oxidation of Cr+3, the addition of Mg⁺² in an alkaline buffer, is required in Method 3060A to suppress oxidation of native Cr+3 in the sample (see Method 3060A, Section 3.3).

It is TtNUS' professional opinion that the zero or very low matrix recoveries were due to the reducing sample conditions and not because of the pH used to digest the sample. The combined and interacting influences of ORP, pH, and reducing agents that may be present in the sample matrix (organic acids, iron II, and sulfides) may have reduced the hexavalent chromium spikes (see also Section 8.5.1 of Method 3060A). This phenomenon is also noted in "Chromium Speciation Analysis in Soils/Sediments - Zero Percent Matrix Spike Recoveries May Not Equal Unreliable Data" and "Hexavalent Chromium Extraction from Soils: Evaluation of an Alkaline Digestion Method" (see attached). The lower post-digestion spike recoveries may also be explained due to reducing sample characteristics whereby the post-digested Cr+6 spiked may have been reduced to Cr+3.

The soluble and insoluble spike recoveries for the laboratory control samples (LCS) were within the 80-120% recovery limits indicating that the laboratory analysis was within controls.

Comment 6. The Tetra Tech data validation report indicates that the MSA correlation coefficient result was below the quality control limit for sample D02645. The data on page 20/25 indicate that the correlation coefficient is .998 which is within the acceptance limit. Therefore, the positive result should not be estimated in sample D02645.

Response: TtNUS agrees with EPA's comment based on the originally reported data. However, it should be noted that based on further evaluation and the revised data validation report, the analytical result for this sample was rejected. Revised data tables are presented in the revised data validation report submitted on December 31, 2001.

Comment 7. The laboratory data package and the Tetra Tech NUS, Inc. data validation report indicates Cr(VI) in sample D02743 as 20.5 mg/Kg. This value could not be reproduced. According to the calculation on page 23/28 of the data package the result should be 4.64 mg/Kg.

TtNUS agrees with EPA's comment based on the originally reported data. However, it should be noted that based on further evaluation and the revised data validation report, the result for this sample was rejected. Revised data tables are presented in the revised data validation report submitted on December 31, 2001.